RAILROAD GAZETTE

FRIDAY, SEPT. 19.

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Contributions.

Track Jacks.

The Philadelphia & Reading Railroad Co.,
OFFICE GENERAL SUPERINTENDENT,
PHILADELPHIA, Sept. 10, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Sept. 5 I notice your editorial in reference to the Quincy disaster on the Old Colony Railroad. It is a rule on the Philadelphia & Reading Railroad to use track jacks entirely on the *outside* of the rail, never between the rails. I consider that there is very little possibility of derailing trains with track jacks, provided they are not used between the rails.

GEORGE F. FOX.

Painting the Water Surfaces of Boilers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It would be of interest if Mr. Porter, of the Cincinnati, Sandusky & Cleveland, would give a few more particulars with reference to painting the inside of boilers with asphaltum. [See *Railroad Gazette*, Aug. 8.] It seems very probable that the adhesion of scale would be much hindered by this, but is there no danger to the boiler. In stationary practice boilers have been known to be seriously injured by a thin coat of oil paint upon the surface of a plate the other side of which was exposed to fire. Asphaltum—whatever this may be, there being so many articles of this name from coal tar and pitch mixtures to natural asphaltum—may be very different in its action and, therefore, if Mr. Porter would state just what his asphaltum is, it would be welcome to many who, like myself, may hesitate before coating any fire-heated plate with anything of the nature of "paint."

W. H. BOOTH.

The Office of Distant Signals.

BUFFALO, N. Y., July 28, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have just been reading your editorial of last week (July 25) on distant switch signals, a subject which I am glad to see discussed, because there is much need of reform in connection with it. The funniest fact shown in your article is that about the shuffling policy of the Pennsylvania lines west of Pittsburgh in trying to invent a name to fit their inconsistent signal instead of changing their signal to conform to correct principles. The ingenuity displayed in finding two or three different terms which really mean the same thing, but which can be arbitrarily declared to mean something different, is really interesting; but how can any one avoid asking why they did not just take a hand saw and cut a notch in the ends of their square-ended semaphore blades, and thus quickly make them cautionary signals in fact instead of only in name. But perhaps I am hypercritical.

A local paper has printed a transcript of the circular issued by the Erie, to which you refer in the same editorial, and I notice that it says that "all trains passing such a distant signal when at danger must be under full control." If this is the actual language used by the Superintendent of the road, it is surprising that, while making a change which is intended to bring his practice into conformity with the best standards, he should have made such a mischievous error at such an important point. It is true that other roads practice this same inconsistency, but I have always attributed it to mere neglect. I had supposed that when once these defective rules were overhauled they would be made right. The question is, If trains must be under control *when passing the signal*, why should the signal not be placed directly at the switch? If they must be under control at the signal, the brakemen must *begin* to control it some time *before* reaching it; and if they must begin to hold their train at a point selected by themselves, why do they need a signal at all? I have always supposed that a distant signal was to give trains time and room to stop *after they passed it*, and before they reach the switch; but if they must have their speed reduced at the signal I don't see why they need additional space after passing it to reduce it still further; nor do I see why a 50-cent post would not answer just as well as an expensive semaphore.

P. S. E.

The Kinzua Viaduct.

THE PHŒNIX BRIDGE CO.,
PHŒNIXVILLE, Pa., Sept. 11, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The report having been widely circulated by the press of the United States that the great Kinzua Viaduct on the line of the New York, Lake Erie & Western Railroad was to be removed on account of its not being strong enough, and a new line was contemplated to be constructed, I addressed the following letter to Mr. Charles W. Buchholz, the Engineer of Bridges and Buildings for the N. Y., L. E. & W. R. R. Co.:

PHŒNIXVILLE, Pa., Sept. 4, 1890.

CHAS. BUCHHOLZ, Esq., etc:

My Dear Mr. Buchholz: I heard that the Kinzua Viaduct was to be either abandoned or removed and a new line was contemplated to be built. I write to ask you whether this rumor is correct, and if so would ask the reason why the viaduct is to be removed. Has the structure shown any signs of weakness in any part, such as loose rivets, or any excessive deflection or lateral motion, all of which I doubt very much.

Kindly let me hear from you at your earliest convenience. I remain, yours very truly,

A. BONZANO.

To which Mr. Buchholz replied as follows:

NEW YORK, Sept. 5, 1890.

A. BONZANO, Esq.,
Vice-President Phœnix Bridge Co., etc.:

Dear Sir: In answer to your favor of the 4th inst., I beg to say that the announcement that the Kinzua Viaduct is to be abandoned is a mere newspaper rumor. I heard nothing of it until last week while I was in Chicago. The structure has shown no signs of weakness of any kind, and maintains its full efficiency for the loads it was designed to carry.

Respectfully yours,
CHAS. W. BUCHHOLZ,
Civil Engineer.

This viaduct is one of the most important railroad structures in the world, and is of recent construction, having been constructed in 1882. It is 2,052 ft. long, 301 ft. at its greatest height, and divided into groups of spans of 40 and 60 ft. alternately. It is designed for carrying trains of coupled consolidation engines, each engine weighing 161,340 lbs. on a wheel base of 45 ft. 3 in. and 88,000 lbs. on a wheel base of 14 ft. 9 in. It is proportioned to resist a wind pressure of 50 lbs. per square foot on the unloaded structure and 30 lbs. per square foot on the loaded structure. Under the above loads no part of the structure is strained more than one-fifth of its ultimate strength. The viaduct is as safe and as strong as 90 per cent. of all the railroad bridges which are now in daily use.

ADOLPHUS BONZANO,
Vice-President and Chief Engineer.

[The substance of the above appeared in the *Railroad Gazette* Sept. 12, before this letter was received, but the matter is one of much importance to a few people and great interest to many. Therefore we give the letters in full to settle the matter.—EDITOR RAILROAD GAZETTE.]

Fair Demurrage Rules.

Western New York Car Service Association,
BUFFALO, N. Y., Sept. 9, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the article in your issue of Sept. 5, entitled "Demurrage on the New York Central," I desire to echo your commendation of Messrs. Ewings and Wattson as expert car accountants, and for "painstaking methods." These gentlemen will no doubt be glad to advise you that, after looking over the rules, blanks, etc., of nearly all the various car service associations, they finally adopted, almost verbatim, those in use by this Association.

Noting also the criticisms in this article upon those rules, I desire to say, for your information, that not only do we provide for prompt settlement of all claims made for refunding of car service paid on account of bad weather, but generally provide for prompt refunding of any amounts paid on account of delays in unloading whenever it can be shown that the railroads were at fault in *any way* for the delay to the car, either by "bunching," delay or neglect in placing, etc. The rule that "claims will not be considered unless accompanied by receipts for the amount paid" was made by the Association for the reason that agents report collections weekly, and claims are frequently presented before the end of the week; so, while our records may show car service earned, they might not show it paid unless the receipt was presented with the claim; and by this method refunds are expedited. We presume the New York Central retained the rule for the same reason.

"The question of notice of arrival of freight will not be taken into consideration in the settlement of claims" is also a rule that you object to. But, did car service begin at the time the notice was *sent* or when it was *received*, endless disputes as to this time would be the result. To avoid this conflict, this Association decided that instead of having the 48 hours free detention, begin on the arrival of the car, as in nearly all car service associations, it would allow a certain time to elapse before the beginning of the 48 hours, which time should be ample for the giving and receipt of notice. The agents here agree to give this notice by mail or special messenger, whichever may be the more rapid and certain method. We seldom have a complaint as to non-receipt of notice. Most of the stations covered by the New York Central rules are small, and the consignee in most cases knows of the receipt of a car as soon as does the agent.

The rule that agents shall refuse to switch cars for a party who refuses to pay car service, and which seems to "introduce an unnecessary disturbing element," is modified by this Association to cover only cases where parties have private sidings, the managers claiming a legal right to do this. In other cases, the property on which car service has accrued is held until such charges are paid.

E VAN ETTEN, Manager.

[We are glad our correspondent has put in use a code of demurrage rules so good that other people are obliged to copy it, and we are sorry he did not tell us about it earlier, so as to get all the credit he deserves. Our statement concerning Messrs. Wattson and Ewing's instrumentality in getting up the New York Central rules was based on what we read in the journal to which we referred in the article. The essential point in the matter of demanding the presentation of vouchers is, that it is unbusiness-like for A to demand from B detailed information about what he (A) has done. If an agent has collected money and has not returned or reported it to headquarters, it would seem perfectly fair to settle with the complainant (if he came direct to headquarters) by giving him an order on the agent, directing the latter to refund a certain definite portion of a certain amount which he *had collected*, thus making the payment contingent upon the actual possession of the money by the agent (or the company). There is nothing wrong in demanding that the receipt be exhibited at the time the money is actually refunded. The difficulty comes when the claim has to be sent some distance by letter and is several days in course of investigation and settlement. It is not an actual damage done to claimants that we are talking about, but the offense to his notions of business propriety. In one sense this may be regarded as nothing but sentiment; but sentiment and business are not so wholly disconnected as we sometimes think. An arbitrary allowance of time for the making and delivery of a notice is not a bad idea for a compromise, but the smooth working of such a plan involves dependence upon the legal right to give no notice at all. As we have before said, we do not believe in standing upon this right so rigidly as is generally done. It is true that intelligent care is required to regularly give notices in such a way that recipients will not dispute your word afterwards; but American railroad men will probably have to learn how to do it some time.—EDITOR RAILROAD GAZETTE.]

Valve Gear for Compound Locomotives.

18 DUNSTAN'S HILL, LONDON, E. C., Aug. 5, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the communication from Mr. von Borries on "Starting Gear for Compound Locomotives," which was published on page 429 of your issue of June 20, after describing the principle of the intercepting valve in the receiver, as employed by himself and others in their systems, the writer goes on to express an unfavorable opinion on the Lindner starting gear by which the necessity for such a valve as the Von Borries is done away with.

Mr. von Borries' condemnation is based upon *one* express compound locomotive only. The arrangement of this engine as to cut-off was unfavorable, and it was also fitted with the Lindner system as originally designed, the steam for starting being led into the receiver from the main steam pipe, instead of from the regulator, as described below.

The results obtained with a large number of express and goods engines worked on the Lindner system on the Saxon State railroads, where the traffic is very heavy and the gradients steep (1 in 40 to 1 in 100), as well as the comparative results attained with others running on the same lines and fitted with the Von Borries intercepting valve, do not bear out the statements of Mr. von Borries. The Saxon State Railroads have adopted the Lindner system and have at present 26 locomotives of various types working with it, whilst 32 more are to be placed on the line in the course of the current year. Other railroads which have made trials have also decided on adopting the Lindner systems and there are in all as many as 98 locomotives in traffic and in course of construction. A locomotive with this starting gear will shortly be running on the Pennsylvania Railroad, whilst the Royal Prussian railroads, which have hitherto con-

structed a number of Von Borries locomotives, are now building a few on the Lindner system.

To gain a maximum tractive force to start tightly coupled trains, the arrangement described in your issue of last year has since been improved, and two modes of obtaining the desired result have been devised, as follows: With an express and passenger locomotive, or, indeed, any engine up to 30 tons adhesion weight, the steam for starting is led from the regulator in such a manner that the opening of the port for admission of steam to the starting cock, and thus to the receiver, does not take place until the regulator is fully half open. If now the high-pressure cylinder has to exert the necessary pull for starting, this will be done without any back pressure; if, on the other hand, the low-pressure cylinder is to do the work, this takes place either during or after the complete opening of the regulator, while at the same time the pressure on either side of the high-pressure piston is equalized by the provision peculiar to the Lindner system, of the two small equalizing passages in the high-pressure slide.

As it is possible, in the case of a locomotive which has to draw a tightly coupled train, to open the regulator fully without any difficulty, and without causing any violent jerks, the driver of an engine fitted as above described has simply to open his regulator slowly but completely, and without minding at all in what position the cranks may happen to be. Thus, as the stroke of the high-pressure piston first commences, the admission into the receiver of steam which is gradually increasing in pressure commences before the first exhaust from the high-pressure side to the receiver, and the movement is continued by the low-pressure piston, with the same force as by the high-pressure piston, in consequence of the tension of the steam in the receiver already increasing gradually, while the high-pressure piston is working and then continuing to increase, owing to the continued admission of steam.

Should, however, the first impulse have to come from the low-pressure piston, this will take place, with properly warmed cylinders, in a scarcely measureable interval of time, the impulse taking place as soon as the fresh steam which is entering the cylinder has attained the necessary degree of tension, the pressure being at the same time equalized on both sides of the high-pressure piston, which then continues the movement with its full power. Thus, in both cases, the impulse is given with a maximum degree of evenness, and with the full power necessary at once, from the first commencement of the stroke of the piston.

With a powerful goods engine, which has to set in motion in succession a number of loosely coupled vehicles, such an immediate development as above described of its specially high tractive power would act too rapidly, and thus endanger the couplings. With such a locomotive, therefore, the fresh steam is still led from the main steam pipe, as was done with the first designed Lindner engines, but not direct into the receiver, as was the case with them. The steam, in the case of such a goods engine, passes first into the high-pressure cylinder, through two pipes which branch off from the starting cock, and thence into the receiver, either through one of the two small peculiar slots specially provided in the high-pressure slide, or else through the hollow recess in the slide. If the position of the orifices in the high-pressure cylinder for these two pipes be suitably chosen, relatively to the positions of the crank, the high-pressure piston, when making its stroke, can have little or no back pressure.

The fundamental principle of the Lindner system is in this case also maintained, namely, that the admission of steam to the receiver begins before the first exhaust from the high-pressure cylinder enters it, and the low-pressure piston is thus enabled to work with a force equal to that of the high-pressure piston which preceded it. It is only necessary, with this mode of carrying out the invention, to open the regulator quite slightly in the first instance, since a moderate steam pressure is sufficient to overcome the initially small resistance at the start, whilst the regulator can be further opened as the resistance increases.

In the first designed Lindner locomotives the steam for starting is led direct, as above stated, from the main steam pipe to the receiver, in which case it is only when the regulator is opened too timidly, that the high-pressure piston can produce in starting any noticeable back pressure, whilst these locomotives will satisfy all conditions if, with tightly coupled trains, the regulator is at once fully opened.

The immediate development of the maximum power, which is necessary for starting tightly coupled trains, results from the mode of construction first described, while in both cases the greatest possible degree of evenness of traction is obtained, and consequently locomotives fitted with either of these appliances start just as easily as those fitted with the intercepting valve of Von Borries and others, while experience has shown that they work in traffic equally well.

We may here remark, with reference to the intercepting valve, that the quality claimed for it, of keeping the receiver empty whilst the low-pressure piston is beginning its stroke, is not found to be maintained in practise, since, in course of time, the large valve, in addition to the effects of the automatic movements, does not continue tight.

Besides this, supposing even that the receiver really remains empty, a considerable degree of inequality of impulse occurs with a Von Borries locomotive, when starting by means of the low-pressure piston, because this piston during the first stroke only moves with the force necessary to overcome the tractional resistance, whereas the high-pressure piston is working with the maximum force due to its own area and the pressure of steam in the boiler. For this reason these locomotives start with a greater amount of jerking than occurs with the Lindner system.

In regard to the smoothness of starting, the variation in the starting force, within the limits due to the transmission of the effort of the piston to the periphery of the driving wheel by means of the crank mechanisms is almost the same in the case of a Lindner engine as with any non-compound locomotive, such force being greatest for starting when one of the two cranks is vertical, and least when one of them is at an angle of about 45 deg. forward or backward.

Since the low-pressure piston, as a rule, has rather more than doubled the area of the high-pressure one, the low-pressure cylinder necessarily exerts a somewhat greater effort, and under such conditions there are only two positions of the high-pressure piston in which it has its minimum of starting power, namely, those about 45 deg. from the previous dead point, whereas with a non-compound locomotive there are four such positions.

If it be remembered that, in the case of a compound engine which has a duty to do equal to that of a non-compound one, the product of steam pressure and area of the high-pressure piston are greater by at least 15 per cent. than with the non-compound engine, it will be seen that a well-designed compound must always give a greater starting power than a non-compound locomotive doing the same duty.

If now we consider, finally, the circumstances which take place during shunting in carrying out short movements, it must be first of all observed that, with every compound locomotive which has made more than one revolution under steam, a larger amount of steam remains inclosed within the tubes, etc., after the regulator has been closed than is the case with a non-compound locomotive. It is therefore important that the regulator should be closed somewhat sooner, but otherwise there is no difficulty whatever in moving detached portions of trains, or in bringing an engine up to its train. Whenever a small movement only of the engine is required, the regulator must only be opened for quite a short time, and it should therefore be so fitted as to move very easily.

In the Von Borries engine, where steam is led to the low-pressure piston only, and after this the regulator has been closed but the high-pressure port is being still opened, a full effort (area of piston × pressure in boiler) of the high-pressure piston will occur before the engine ceases to work, in consequence of the receiver being empty; and beside this, if the engine is not previously brought to a standstill, there will also follow an effort of the low-pressure piston, owing to the steam which is exhausted from the high-pressure cylinder.

With the Lindner engine, in consequence of the pressure already present or being developed in the receiver, the effect, in the case of the high-pressure cylinder, is less, and the subsequent effect in that of the low-pressure cylinder not greater than with the Von Borries engine. Shunting can therefore be carried out with the Lindner locomotives (more especially in the case of goods engines, which have so much shunting to perform) with the greatest facility and accuracy, no matter in what position the cranks may be.

One unpleasant peculiarity of the Von Borries locomotive, as well as of any other engine with an intercepting valve, may here, in passing, be alluded to: namely, that if the least steam is present in the receiver when it is the low-pressure piston which has to make the start, the engine will not exert any force at all until the driver has opened the blow-off cock and thus cleared the receiver completely of steam. This occurs not unfrequently when shunting, during which the engine is often brought to a standstill before the receiver is empty; and in such a case perhaps the word "dangerous" might be applicable, if the necessity of quickly removing the locomotive from its position should be in question. With the Lindner engines steam may be in the receiver during shunting, but it makes no difference, and the starting effort is attainable at any moment.

When Mr. Von Borries, at the close of his letter, states that the force sufficient to start a train under all circumstances cannot be obtained without an intercepting valve, and that, after testing almost every possible arrangement, he had found it impossible to make certain of starting without employing such a valve, it can only be said that while making his trials he must have been in ignorance of Lindner's slide channels for removing from the receiver the pressure against the high-pressure piston while the low-pressure piston is making its stroke.

The chief advantage of the Lindner system is precisely that of rendering it possible to dispense with an intercepting valve, which, worked automatically, either by means of a weight, a small piston or a steam slide valve, only blocks up the receiver, and thus gives occasion for possible failures, whereas the means employed in its place are most simple and absolutely certain, and possess, as a part requiring movement, only a cock, the working of which, as far as the driver is concerned, is involuntary and unavoidable, and which, after years of use, shows no sign of wear, while a possible leakage, even, in it would create no inconvenience.

A further advantage is gained by the increase of tractive power obtainable in an emergency by opening the reversing gear to its full extent, because then, in addition to the steam from the high-pressure cylinder, some fresh steam from the boiler reaches the low-pressure cylinder, while there is also the possibility on long and steep inclines, or on the occurrence of any sudden danger of running with the steam reversed without any difficulty. Both of these valuable aids in traffic are available with the Lindner system without any additional gear, whereas with the Von Borries engine, with intercepting valve, they can only be obtained by providing special extra arrangements for the purpose.

The groundless condemnation of the Lindner system already referred to has forced us to submit the question of the merits of the different systems to the impartial judgment of the competent reader. HOPE & CO.

Farmer's Passenger Car With Side Entrance.

The passenger car shown on the opposite page is the invention of Mr. L. P. Farmer, late General Passenger Agent of the Erie Railroad, and now Commissioner of the Passenger Department of the Trunk Line Association, and has been patented by him in this country and Europe. The main feature of novelty is in the side openings at the centre of the car, the end platform and steps being dispensed with.

In the illustrations, fig. 1 shows the exterior of the car with doors at the centre of its length. It is designed to have a vestibule connection at each end without side doors. The entrance at the centre has double doors, divided either on a horizontal line—Dutch door fashion—or on a vertical line, as common with double doors. The car door sill is just above the station platform, and the steps up to the floor of the car are wholly within it, and extend close to the aisle or passage way, as shown in fig. 2. The opening over the steps in the car may be covered by a sliding floor, or protected by a simple gate. Door openings are provided on both sides of the car, opposite each other. The method of framing is shown in fig. 3, the break in the side sills being compensated for by heavy diagonal bracing to the sills; but in some cars to be built by the Erie the framing is altered to carry the compression stresses above as well as below the door.

Some of the advantages claimed for this car are worthy of consideration; for instance, a most important safeguard is secured in the requirement that passengers must enter and leave the car on the station or platform side; and with the doors closed it will be impossible to get on or off while the train is in motion. Another feature of safety lies in the elimination of dangerous platform riding, now common on suburban trains on many roads.

The steps in this centre exit will be 4 ft. wide, and the car can be quickly emptied at stations, because a greater number of persons can pass out at the same time, while in the common form of car the front exit is used by nearly all of the passengers, who must pass out in single file, the rear platform being comparatively of little use.

Mention might also be made of the more gradual rise of the steps, and the incidental increased convenience to old and feeble persons and children. It is also possible for passengers to occupy the steps while the train is in motion without danger to life or limb. In stormy weather one steps directly from the car to the station platform, and thus avoids, to some extent, at least, the rain that in the case of ordinary cars drives down between them and upon the passengers where protection by umbrella is impossible; besides, the wet and slippery steps, that are annoying and dangerous, are avoided. In the winter season, when ice ordinarily forms on the platform and steps, this car will be free from such troubles.

When approaching a station it is customary for trainmen, particularly on suburban trains, to open the end doors, shout the name of the station and leave the doors open, in order to facilitate the exit of passengers and decrease the length of the stop. Under these conditions the cold air rushes in and renders the ends of the cars almost unendurable, and causes much complaint; in this car door and step arrangement, it is expected that all such trouble will be obviated by avoiding the necessity of opening the doors, the exit being more rapid and easily made, and the doors never open when the car is in motion. Brakemen being wholly within the car, and the extraneous sounds shut out, the station calls are more easily distinguished. Further than this is the additional advantage of always having the steps and station platform well lighted without a special light on the outside at the ends of the car.

The seating capacity is increased above that of the common car by two seats, for equal lengths over all. The construction and external appearance are well shown by the cuts, and further description is unnecessary, unless it be to state that owing to the close proximity of the ends of the cars a vestibule connection is practically established between the two.

It is about decided that a train of three cars made after this design will soon be constructed for the Orange Branch of the Erie, and the cars will be built with a

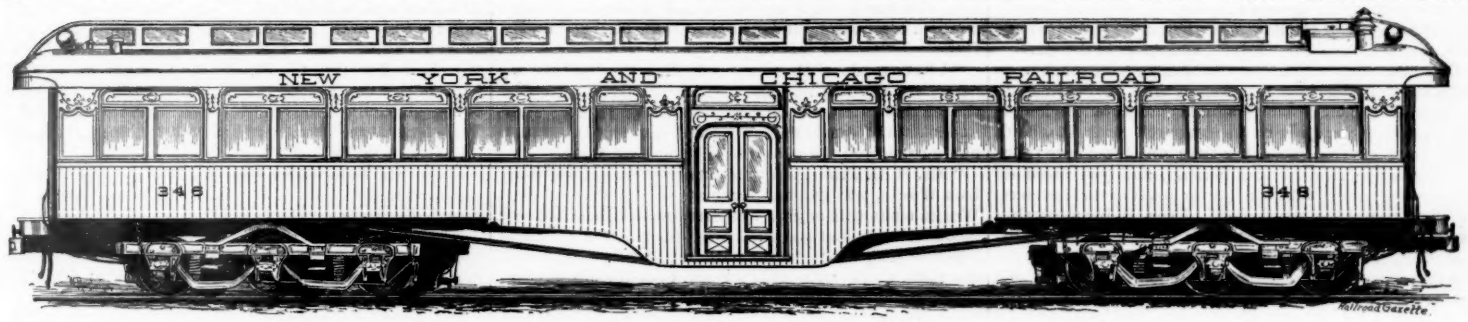


Fig. 1—General Elevation, from a Photograph.

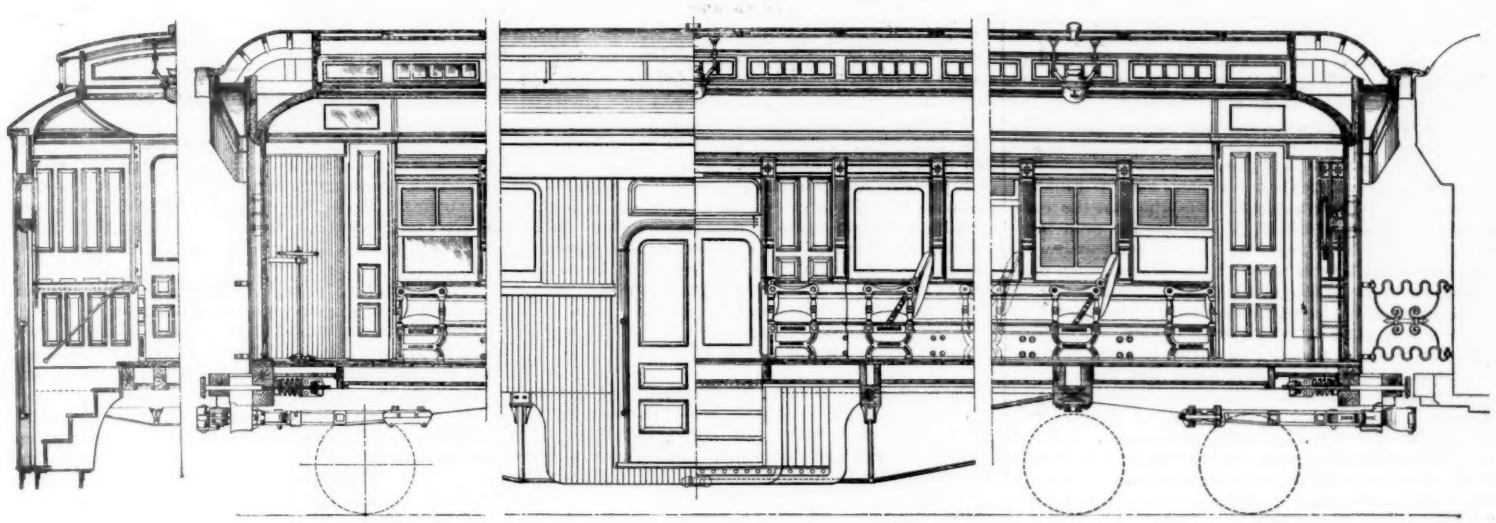


Fig. 2—Sectional Elevations of Ends and Middle of Car.

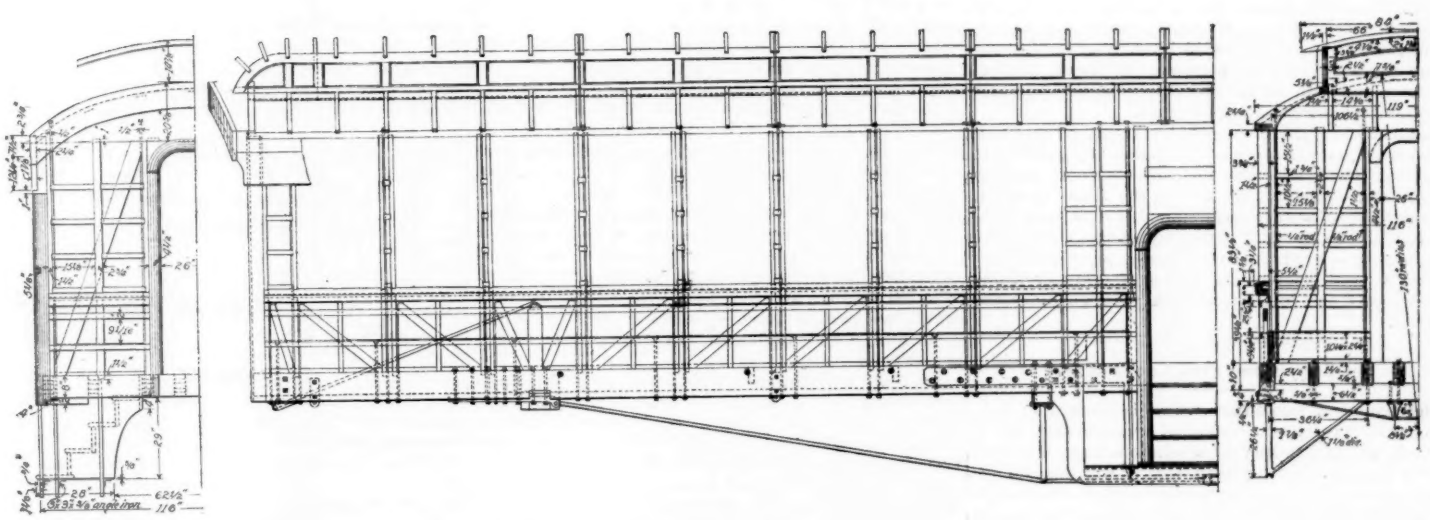


Fig. 3—Showing Framing.

view to handling the commuters with the greatest comfort to them and the least trouble to the railroad company.

American and English Cars in Accidents.

FROM AN ENGLISH CORRESPONDENT.

There is one specially noticeable difference between an accident to a passenger train in America and one of equal mechanical gravity in England.

The American accident is frequently accompanied by something worse, a fire or a scalding by steam. The reports of the Quincy accident on the Old Colony line seem to show that some 70 people in one car were pitched into one mass with broken-up seats and more or less scalded by steam from the boiler, either escaping through a rent or a broken fitting.

This style of accompaniment to a pitch-in is practically unknown here. A car equal in length to an American car will be divided into six, seven or even eight separate compartments holding altogether from 36 to 80 people, according to class, and with 12 to 16 doors, one-half of which are locked and one-half free to open as against only two doors in an American car. Supposing a divided car is pitched upon a locomotive, and an escape of steam takes place. At most such escape would enter one compartment only and not the whole carriage. Further, in English cars there are no loose seats, and it seems to be largely due to the breakage of the weakly attached seats in the American cars that passengers are held fast and prevented, even if unhurt, from making their escape.

The long open car with many passengers and few doors is responsible for the heaping up of 70 passengers in a struggling mass with broken iron and timber. The absence of side doors, which is supposed to enable a car to be more strongly built, seems to result only in more securely holding passengers in prison, and the flimsy and badly fastened seats are a further danger which has so frequently manifested itself of late years that something surely should be done to avoid repetition. The American press generally is so derisive of the compartment system and its disadvantages that it would be, I should suppose, useless to endeavor to introduce it in America, though an experience of both systems has failed to commend to me personally that system which allows one to be pelted by books and papers, to be touted by candy sellers, etc., and breathed on from behind by fumes of onion or liquor. There is, however, a way of arranging cars on the American plan of two end doors and a through passage which would be far better than that now in vogue. I refer to the plan which was common in the New Zealand railways when I last saw them, now some 12 years ago. There, such cars as were not divided into compartments had seats arranged down each side just as in an ordinary tramcar, passengers sitting face to face and riding, of course, sideways.

These cars have the advantage accruing to freedom

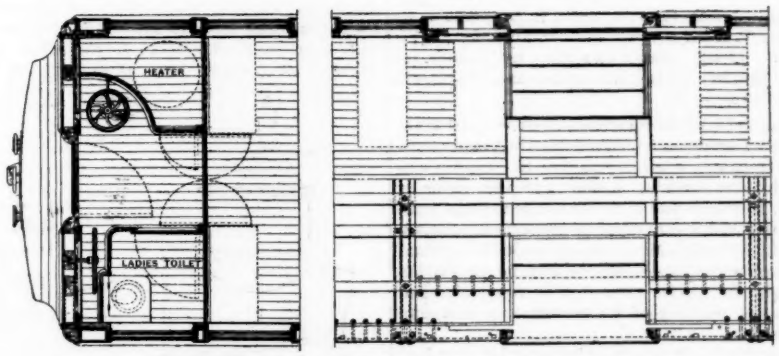


Fig. 4—Floor Plans.

FARMER'S PASSENGER CAR WITH SIDE ENTRANCES

from broken seats, though in event of a pitch-in there is still the danger of all passengers being heaped up at one end, and there are only the two end doors of escape.

Of course national characteristics may have much to do with determining why Americans like to be in open cars; but the chief reason, I should judge, is the length of a journey in America as compared with England. Americans have no cars other than one type; here there is every variety, including American, and yet these do not seem specially to commend themselves to travelers, or they would be multiplied. Even if incontestably proved to be the best, the extreme danger of the cross-seated, long open car should be a sufficient excuse for the introduction of some modification. With all the real and supposed disadvantages of compartments, there is only one burning fatality on record against them in England, and that was due to a collision with some runaway trucks, petroleum laden, at Abergele, and could not occur again; and even this accident, bad as it was, would have been worse with end door cars.

It is often stated that carriage doors are locked on an English train. This is not the case. The off doors are locked, but not those on the left side for getting in and out. A system which is so dangerous as to call for the placing of an axe in easy reach in every car must be one requiring amendment, and the enormous loss of life entailed is surely a more than sufficient load to counterbalance all contra advantages. It is true that the compartment system has been responsible for even murders, but these have been few indeed compared with what would have been caused by fires and other dangers of open cars, whilst other dangers have not been really so serious as to warrant a change. One hears of cases of attempted extortion or blackmail. Would-be blackmailers have always a character so notorious that little need be feared from them if one has the courage to go to court and all antecedents are looked up. At the same time there are undoubted disadvantages, and the system would not go down in America. All the same, the present American car requires serious amendment, the chief being in the direction of better facilities for leaving a damaged car and less loose and breakable material to jam people fast.

Much of the present fire risk would disappear with a rational system of warming (here the irrational system goes to the other extreme, railway directors in England not having a soul above a magnified sort of bed warmer, which, being quite sufficient in most English weather, is at times lamentably deficient in most English winters), and with the introduction of something other than petroleum for lighting purposes.

In this country there are some few trains lighted well by electricity, and a few also well lighted by gas, but as a rule lighting is miserably inefficient in short journey trains, and often entirely absent, the Great Western, for example, running through tunnels a mile long without lights. The tendency of the day seems to be here, as in America, toward the superexcellence of the crack trains, to the neglect of the crowd of ordinary trains both in speed and comfort, though with no difference of fares.

An Early Compound Locomotive.

The compound locomotive which is illustrated here was one of the earliest attempts of a marine engineer to apply a marine principle to a locomotive and is of historical interest. We supposed that it was adapted by Mr. Lay, inventor of the Lay auto-mobile torpedo, who was an assistant engineer in the navy during the war and who assisted with the gallant Cushing in fitting up the launch and torpedo with which Cushing sank the ram Albermarle. Mr. Lay's name does not appear, however, in the account which follows, which is furnished to us by Mr. George B. Ross, Division Master Mechanic, N. Y. L. E. & W. If any reader can give us further information in this interesting matter we shall be obliged. Mr. Ross writes:

"Complying with the request contained in your favor of July 24 last, I send you a reduced drawing, made from the original from which the locomotive in question was compounded. The drawing I send you was made by Mr. Edw. M. Ketcham and is, so far as the arrangement of the cylinders and steam pipes is concerned, substantially correct. Although Mr. Ketcham made the original plans and worked out the details, he had no association with the engine in service after it was remodeled and therefore knows nothing of its performance as a compound locomotive.

"It is impossible to get any exact information as to date of construction or performance of this engine as a compound, for the reason that there are no records, either in the office of the works where it was reconstructed or in the office of the road which furnished the engine for the experiment. Mr. H. O. Perry, the designer, is dead, and Mr. M. E. Brown, who was Master Mechanic for the Erie at that time, has also passed over to the silent majority, so that nothing can be learned from them.

"Mr. J. H. Hubbard, who was foreman of the Erie machine shop at the time, informs me that the locomotive furnished the King Iron Works (at that time known as the Shepard Iron Works) was an old 16 in. × 26 in. Hinkley outside connected engine, and that it was not a success, because of the difficulty in making steam, which he accounts for by there being 'no exhaust,' and this statement is backed up by Mr. Theodore Williamson, who was fireman on the engine when it first came out as a compound, and who is now an engineer on the Buffalo division of this road.

"I have made a thorough search of the books in my office, and can find no record which would denote that the engine 122 was a compound, except one item under date of June, 1870, in which reference is made to having renewed the piston in the small cylinder.

"Mr. H. G. Trout, the present proprietor of the King Iron Works, was general foreman of the Shepard Iron Works when this engine was compounded, and his best recollection is that the work was done in the winter of 1868 and 1869, which tallies with my own recollection of the matter and with that of Mr. Geo. Wilson, present superintendent of the King Iron Works, and who was a journeyman machinist in the Shepard Iron Works, and elbow mate with myself in the same capacity.

"The dimensions of the cylinders were 11½ in. and 24 in. × 26 in. stroke."

It will be noticed that this locomotive has tandem cylinders, two on each side, operated with one link motion, the rotary valves being connected by a rod with straps and keys, as shown. The steam pipe passes out at the front of the smoke box after passing down through it to the bottom. Thence it proceeds laterally to the two high pressure cylinders. The exhaust from the high pressure passes backward, as shown, to the small steam chest of the large cylinder. There seems to be no record of an exhaust pipe, but there are lines on the drawing which show the existence of an exhaust passage. Probably the steam was so much expanded that the exhaust was almost inappreciable, and this caused the difficulty in the steaming referred to.

Notes by the Way.

Mr. W. A. Foster, Master Mechanic of the Fall Brook Coal Co., uses paper as a joint when riveting up the plates of his tender tanks. He states that when paper is used no calking is necessary. Mr. Foster utilizes the comparatively high pressure in the mains of the Corning water-works for operating several drop pits, an ingenious device for loading car wheels, and another for lifting one end of a loaded car, instead of jacking, all great time and labor savers. He claims to get very satisfactory results by using loose cast-iron disks, about ½-in. thick when new, let in flush on the inside of the driving wheel hubs. When these become too thin, new disks are applied, each in two pieces. In the case of new engines, each disk is in one piece.

Mr. L. M. Ames, Master Mechanic of the Beech Creek Railroad at Jersey Shore, has adopted as a standard for freight service a 12-wheeled engine, having eight driving wheels and a four-wheeled swing-bolster truck. His reason for deviating from the ordinary design of a consolidation engine is that the road has an unusual percentage of curvature of short radius, which resulted in the engines of the consolidation type cutting the flanges of the front pair of drivers to a serious extent. The 12-wheeled engines are free from this defect, the rigid wheel base being reduced by making the tires of the front drivers without flanges; the third pair of wheels is also bald.

Mr. Ames reports good results obtained by having a 3-in. opening in the centre of the sliding stop gates of the front-end spark outlets. The engine fronts show no sign of burning, and it is said to be no detriment to their steaming. Mr. Foster, of the Fall Brook, follows a similar practice, leaving an opening 3½ in. in diameter. Bituminous coal is used on both roads.

Notwithstanding the fact that several radical changes were in progress in the shops of the Schenectady Locomotive Works, 30 locomotives were turned out during August, as follows: Two 20 in. × 24 in. consolidation 63-ton engines and three 19 in. × 24 in. ten-wheeled 61-ton passenger engines for the E. T., Va. & Ga.; of the latter, one is a compound. Five 18 in. × 24 in. six-wheeled switchers and eight 19 in. × 26 in. mogul 60-ton freight engines for the N. Y. C. & H. R. Two 18 in. × 24 in. passenger engines and two 18 in. × 24 in. six-wheeled switchers for the C., H. & D. Four 18 in. × 24 in. ten-wheeled engines for the L., N. O. & T. One 17 in. × 24 six-wheeled engine for the Lake Superior Terminal & Transfer. Three 19 in. × 24 ten-wheeled freight engines for the C. & N. W.

There are now under way ten 19 in. × 24 in. freight engines for the C. & N. W., and five 19 in. × 24 in. six-wheeled engines for the C. & O.

When the improvements now in progress have been completed, the Schenectady Locomotive Works will be in a better position than ever to produce the highest class of work, quickly and economically.

The Rogers Locomotive Works are engaged upon the following engines: A lot of 19 in. × 26 in. moguls with 64-inch wheels for freight service on the N. Y. C. & H. R.; some 18 in. × 24 in. freight moguls for Cuba; two 18 in. × 24 in. ten-wheeled freight engines for Jamaica; 19 in. × 24 in. ten-wheeled freight engines for the C. & O.; 19 in. × 24 in. ten-wheeled freight engines for the Cleveland, Akron & Columbus; 18 in. × 24 in. ten-wheeled freight engines for the Monterey & Mexican Gulf; 20 in. × 24 in. consolidation and 18 in. × 24 in. eight-wheeled passenger engines for the L., N. A. & C.; 20 in. × 24 in. ten-wheeled passenger engines, 65-in. wheels and weighing about 130,000 lbs., for the L. & N.; 18 in. × 24 in. ten-wheeled freight engines for the N. C. & St. L.; 17 in. × 24 in. six-wheeled switchers for the Union Stock Yard Co.

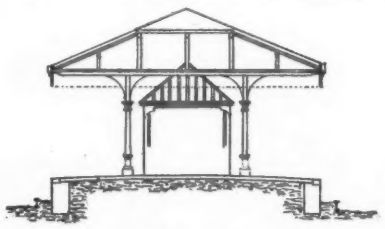
Mr. Wells reports a large proportion of these engines having fire boxes upon the top of the frames.

The Cook Locomotive Works is at work on 19 in. × 20 in. freight engines for the Lake Erie & Western, 22 in. × 28 in. ten-wheeled engines for the U. P., and 18 in. × 24-in. ten-wheeled freight engines for the Illinois Central.

The numerous overhead power traveling cranes in operation at these works have proved eminently satisfactory in labor-saving and in transporting heavy material with the utmost celerity and accuracy. The "Craven" cranes are especially to be commended for their good design and smooth working. C. B.

London & Southwestern Suburban Station.

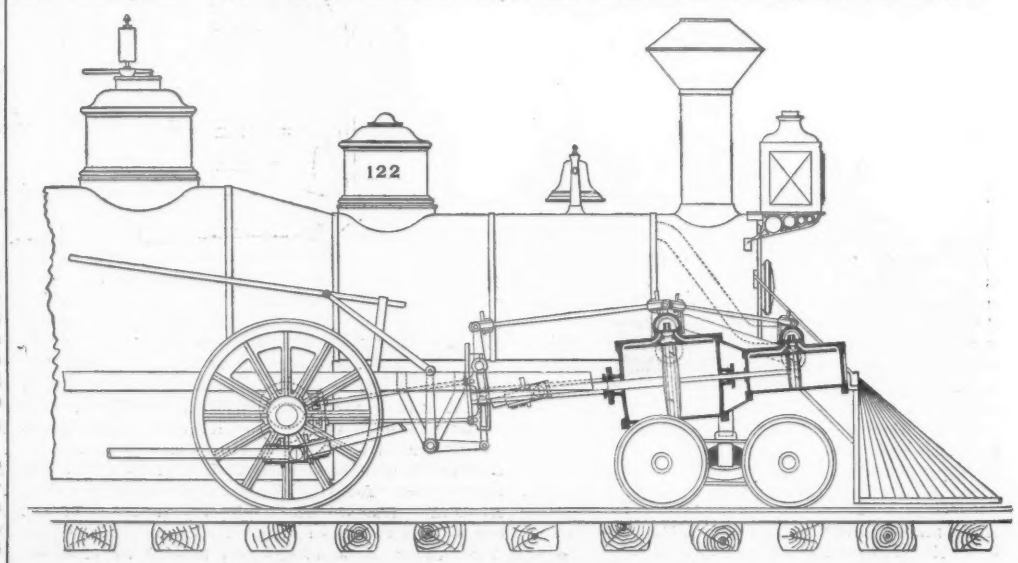
The drawings show an elevation and first and second floor plans of a passenger station recently built by the London & Southwestern, at Southfield, England. We get the cuts and description from the *Railway Engineer*, where they are accompanied by detail drawings of the



Section C.D.

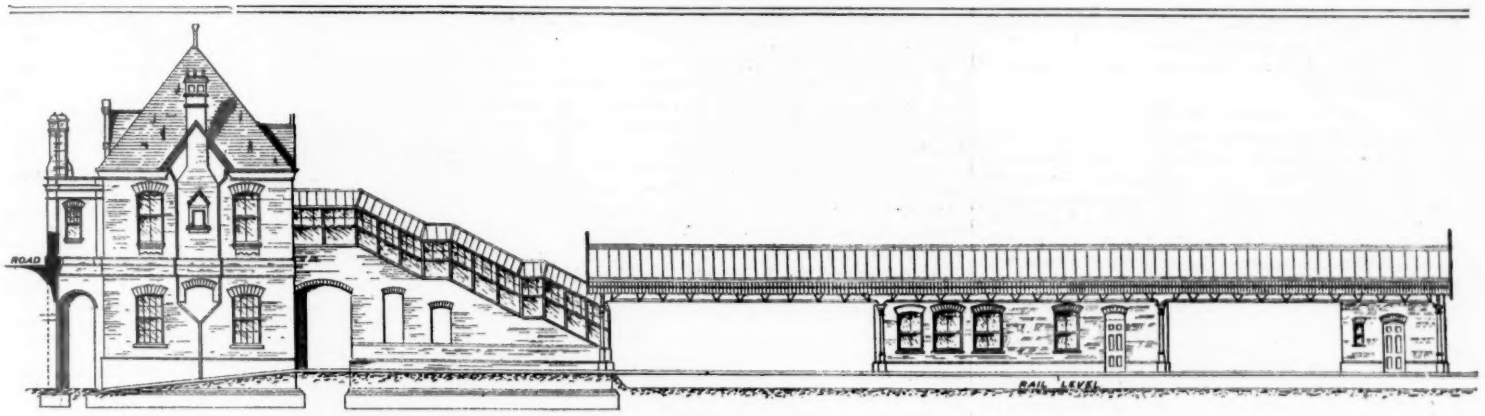
platform roof, which is supported on longitudinal lattice girders. We omit these details, as the principal features of interest in this design, to American readers, are those connected with the general arrangements of the station, which are well shown in the cuts here printed. A number of stations have been built on the same general plan, and the following brief description apparently applies not merely to the Southfield station, but to those at Wimbledon and other places.

They are built with facings of gray stocks, relieved with red brick and red Mansfield stone dressings. The roof is tiled, the style adopted being the Queen Anne. The accommodation for station purposes at the street

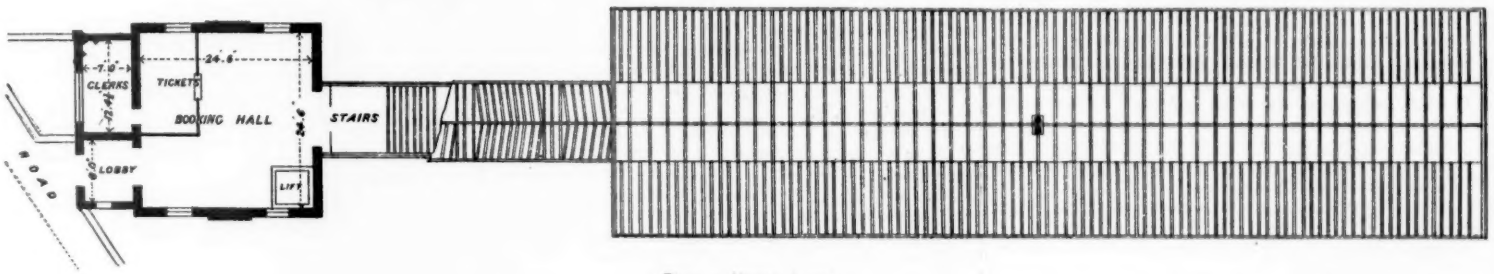


THE "PERRY & LAY" COMPOUND ENGINE APPLIED TO AN ERIE LOCOMOTIVE.

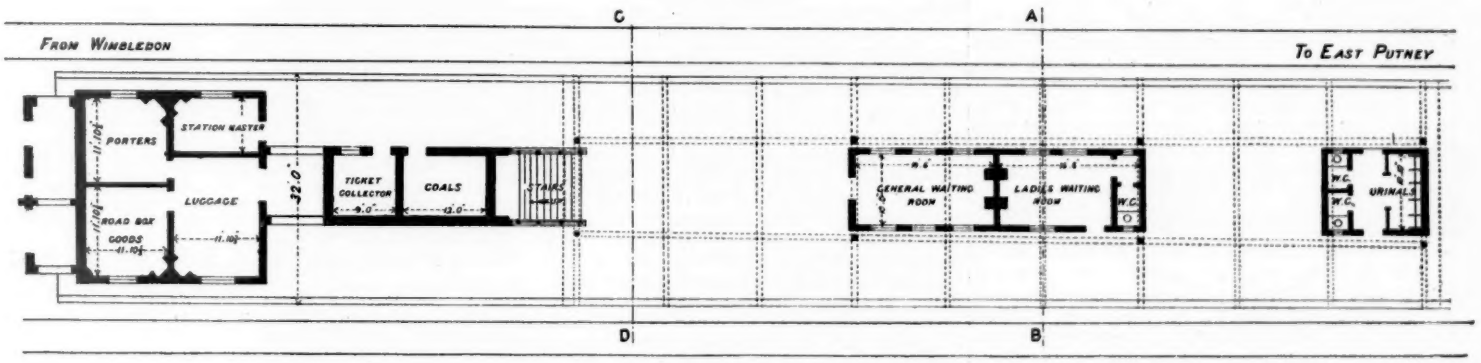
Converted from a simple engine at the SHEPARD IRON WORKS, *Buffalo, N. Y.*, 1868.



General Elevation.



Plan at Upper Level.



Plan at Lower Level.

LONDON & SOUTHWESTERN SUBURBAN STATION.

level consists of a good-sized "booking hall" and ticket office, with steps leading down to the platform. This is an island platform; the up and down tracks running on either side, while the platform with its waiting rooms and offices lies in the middle. The platform roofing is constructed with cast-iron columns placed 40 ft. apart, wrought-iron lattice, trough girders and timber framing, with the necessary supports for carrying the deal sash bars and Italian pattern zinc. The rain water is carried from the eaves gutter by means of the trough girders into the columns, down which it passes, and is then carried under the platform into the sewer. The platforms are tar paved under the roofing, while outside the roofing the platforms are graveled. The signal cabin is placed at the end of the platform.

As will be seen by the plans, the waiting room connected with the ticket office has about 450 sq. ft. of floor surface. The waiting rooms on the platform are 10 ft. × 19 ft. 6 in. and 10 ft. by about 14 ft., respectively. The platform is 32 ft. wide and the covered portion is 128 ft. long. The ticket office is about 8 × 10 ft. Some of the larger stations of this kind are provided with hydraulic lifts for transferring the baggage between the street and the platform levels. The upper floor is 16 ft. above the platform.

Perhaps the most pronounced feature of this plan is the arrangement of stairs, by which the ascent from the platform level to the street is made comparatively easy. The arrangement of waiting rooms in two places, together with the placing of the station agent's office at a point practically quite remote from the ticket office, as well as other details which are obvious to railroad men, bring to mind the familiar fact that the number of men employed at an English station is generally much larger than American roads feel able to afford. Where it is necessary to have one individual act as agent, platform man, ticket seller, baggage agent, telegraph operator, signal man and errand boy, the English system needs material modification.

The Roadmasters' Convention.

The eighth annual convention of the Roadmasters' Association of America was held at Detroit, Mich., Sept. 9 and 10. We gave last week a report of the proceedings of Wednesday, the 10th. Our report of Tuesday, the 9th, was mailed that evening at 8:30, but only reached New York the morning of Friday, the 12th, when the *Railroad Gazette* was already in the mails.

The first session began Tuesday morning, the President, Mr. John Sloan (O., I. & W.), in the chair; John P. Ramsey (C., H. & I.), Secretary. This session was largely occupied in the discussion consequent upon a motion to correct in this year's report of the proceedings various errors in the report of the seventh convention. Attention has already been called by correspondence published in these columns to some of those errors. The motion was carried, and by motion members were requested to be prepared to suggest on Wednesday such corrections as they wished made.

Mr. J. W. Craig (Charleston & Savannah), Past President, called up the matter of the correspondence between officers of the Association and of the Superintendents' Association on standard frogs, and stated that there remained unanswered a communication from Mr. Gadsden, President of the latter association. On motion the officers of the Roadmasters' Association were instructed to acknowledge Mr. Gadsden's communication, that the correspondence might be suitably closed.

Mr. H. W. Reed (S. F. & W.) moved that the President appoint a committee of five to consider a revision of the Constitution and By-Laws, and report at this convention. The Secretary stated that consideration of this subject should come up under unfinished business, such a resolution having been laid on the table at the last convention. A motion to introduce Mr. Reed's resolution under a suspension of the rules was lost. Convention adjourned to 2 p. m.

At the afternoon session the convention took up the subject of the appointment of a committee of five on revision of the Constitution and By-Laws. A resolution to this effect was laid on the table at the Denver convention. On motion this was taken up, and the President announced that he would appoint the committee at a later day.

NUT LOCKS, TRACK BOLTS AND SPIKES.

Mr. H. W. Reed read the report of the committee on the above subject.

The introduction to the report was to the effect that the railroads should exact and manufacturers should give better material and workmanship for all classes of track fastenings.

Nut Locks.—There are two classes, the positive and the elastic. The committee would not suggest any particular make or design, but would lay down some general requirements. For general main line use, an elastic lock washer, made of steel, of such dimensions and temper as to stand a compressive strain of 3,000 lbs., should be used, the compression under this strain not to exceed ¾ in. For frogs and crossings an elastic washer capable of enduring a compressive strain of 6,000 lbs. or a positive nut lock should be used. The washer should give a total bearing surface on each nut and on the plate of ¾ sq. in., or, better still, of 1 sq. in. A washer should be used with every bolt, and the compression should not exceed 80 per cent. of its capacity before closing.

Steel Bolts.—These should be used of the following diameters: For rails of from 50 to 60 lbs. per yard, ¾ in.; from 60 to 80 lbs., ⅞ in.; above 80 lbs., 1 in. All frogs should have 1-in. bolts. The length of the bolt should be such that it will not extend more than ¼ in. beyond the nut when screwed up.

Nuts.—Hexagonal nuts should be used; the thickness of the nut and the dimensions of the faces to be not less than the diameter of the bolt. Standard threads should be used, and the nuts and bolt should be well threaded so as to give uniform contact throughout. The bolt head should be round, with an oblong shoulder next the plate.

Spikes.—Spikes should be of steel, 5½ in. long under the head, and not less than $\frac{9}{16}$ in. square, of the pattern commonly used. They should be cut with points such that they will not turn from the rail in driving and will not seriously injure the fibre of the wood. Steel is recommended as giving greater wear, as well as more strength.

G. W. Bishop, J. M. Mead, J. Kindelan, M. Philbim, H. W. Reed, Committee.

In the discussion which followed, Mr. RAMSEY objected to the specification that the spring washer be not entirely compressed, and also to the use of the hexagon nut. He thought that the compression specified was not sufficient to prevent rails creeping under variation of temperature, and the hexagon nut wears the wrenches too rapidly.

Mr. KINDELAN (C., M. & St. P.) replied that the Committee considered it the function of the spring washer to keep the nuts tight; that it would be impracticable to use sufficient pressure to prevent the rails creeping together, and that the wear of the wrenches was a very minor consideration.

Mr. SHEA (C., N. O. & T. P.) did not see how a nut lock could keep iron from expanding and contracting.

In his opinion he would like to make the nuts as tight as possible. The report was adopted.

Mr. Black (Manhattan), Chairman, read the report of the Committee on

TRACK JOINTS.

He said that the Committee had sent a circular letter to all inventors and makers of joints of whom they could get information. They were surprised at the number of meritorious joints offered and at the improvement made. The Committee is confident that a better joint than the angle splice will soon be found. The circular letter asked for samples of joints and test sheets from civil or mechanical engineers, showing the bearing strength and recovering strength of the joints. It stated that the Committee would recommend for trial such joints as seemed to be meritorious; the results of the trials to be reported to next year's convention.

A great many responses were received, and many joints having more or less points of decided merit were sent in. From these the Committee selected such as they could recommend on the ground of practicability. They recommended the Weber joint, the Long Truss, the Continuous Rail Joint made by McConway & Torley, the Clark Fisher and the Cloud. The Association can have as many of these joints as are necessary for a sufficient trial. The Committee recommends that the Executive Committee arrange for trials and for a report at the next convention.

On motion, the report was accepted with provision that the drawings of these joints be published as a part of the proceedings of the convention.

R. Black (Manhattan), John Doyle (D., L. & N.), B. Murtaugh (C. of N. J.), W. H. Stearns (C. & N. W.), C. E. Marvin (Cent. of Ga.), Committee.

No member of the Committee on the Preservation of Cross-ties was present. It was moved that a new committee be appointed to report at this convention.

Mr. Jordan (Michigan Central) read the report of the Committee on The Best Method of Instructing Section Laborers, with a View to Promotion to be Section Foremen. The report was in effect as follows:

In view of the extremely low wages paid to track laborers, and to the high degree of mechanical skill required of foremen, it becomes very important to take some means of securing better section foremen than can ordinarily be found. In some parts of the South a system of apprentice gangs has been adopted. This may be especially applicable in the South, where the class of laborers is low, but it is not so necessary in the North, as more good men are there available. The system is objectionable, also, in that it localizes the influences at work to create good foremen. The Committee considers it desirable to spread such influences over the entire road, so far as can be done. It recommends, therefore, the appointment of an assistant foreman for each section and for each floating gang; these assistant foremen to be selected from the young laborers; the assistant foremen to be appointed by the roadmaster, on the recommendation of the foreman and supervisor, and to be selected with great care; these men to take charge of the gangs in the absence of the foreman. If an assistant foreman is found incompetent and unfit, he should be reduced at once and another one appointed. These men should have better pay than the laborers, and vacancies in the ranks of section foremen should always be filled from these assistants.

R. Caffery (Lehigh Valley), O. F. Jordan (Mich. C.), P. Nolan (N. O. & T.), Wm. Riley (C. & A.), J. W. Craig (C. & S.), Committee.

On motion to adopt this report considerable discussion arose.

Mr. H. W. REED (S. & F. W.) dissented from the opinion of the Committee. He had had ten years' experience with apprentice gangs, and he was confident that it was the correct system in the South. It secures uniformity in instruction and in practice. For his apprentice gang he has a foreman of unusual intelligence, who puts the young men in the way to learn all varieties of practice. Before this system was adopted he had tried the system of assistant foremen. He found that these men were kept back by the jealousy of the foremen and other causes. They were kept from learning many details of the work. Further conditions vary on different parts of the line, and men confined to one section may not get a sufficient variety of practice. An apprentice gang can be put where the greatest number of conditions is found. His gang does main line work, yard work of all sorts, and is sent to wrecks and wash-outs. The results have been marvelous. The increase in the efficiency in all the men has been very great, and he could not speak too highly of the system. These men are also instructed in making reports, which is a matter of great and growing importance, as the reports of the track men are the key to much of the possible economy of railroad maintenance.

Mr. RAMSEY (C., H. & D.) asked how many men he had in his apprentice gang, how many sections there were, and what wages were paid, explaining that he wished to get an idea of what inducements were offered to young men to go into this gang.

Mr. REED replied that the gang numbered 30 men. He has 86 sections. The foreman of the apprentice gang is paid $2.50 a day. The apprentices are divided into classes and paid 75c., $1, $1.25 and $1.50 a day respectively.

Mr. RAMSEY thought that the chances of promotion would not be great enough to induce men to take employment in this gang.

Mr. REED replied that his men went to other roads, and that the existence of this gang of trained young men was a great promoter of efficiency and fidelity among the section formen. He moved that the Committee's report be laid on the table.

Mr. STEARNS (C. & N. W.) was afraid that most of the roads would not afford the expense of educating men to keep up the complicated system of reports required by so many classes of wages. To his mind the best means of securing good foremen was to pay good wages.

Mr. KINDELAN (C., M. & St. P.) said that there were good points in both the methods suggested, but that there is a third method, viz., the study of the literature on track work. Such literature should be furnished to the men, or they should be asked to get it for themselves. Of course the wages paid are the key to the situation. There is still another way in which good results can be got; that is, to give the inexperienced foremen opportunities to see expert work under men of greater experience. Mr. Ramsey would find difficulty in maintaining an apprentice gang. It would be hard to get men to leave their homes to enter such a gang at low wages, whereas they would go to take places as section foremen. In every gang he could find a man competent for foreman, and he takes pains to promote these men as vacancies occur.

Mr. MEAD (A., T. & S. F.) offered as an amendment that the provision for assistant foremen be stricken from the report.

Mr. JONES (C., B. & Q.) has 28 foremen. He finds it hard to get men of a good class to go into a section gang and wait for promotion. He has one foreman who is as good as any in the United States as a foreman, but in 10 years he has never educated a subordinate to the point of promotion, which illustrates that the best foremen are not always the best teachers. In his opinion it is money that makes good track men. The secret is to pay good wages. This sentiment was loudly applauded.

Mr. BISHOP gave the practice on the Fitchburg road. For years they have had what they call a second hand in each gang. They pay good wages: laborers, $1.50; second hands, $1.75; foremen from $2.50 to $3. When there is a vacancy among the second hands, he looks around the road for the best workman and promotes him. The foremen are taken from these men. The results are very satisfactory. The Fitchburg foremen are competent to do any kind of track work without the help of the road master or of an engineer, and they can write letters which he is not ashamed to send into headquarters with his reports. The system breeds roadmasters, and if the situation of roadmaster should become vacant on the Fitchburg it could be filled from among these foremen.

Mr. MCINARNA (N. Y., P. & O.) thought that the secret on the Fitchburg was one of wages. No one who paid those wages would have any trouble to get good men.

Mr. DAGGET (N. Y., N. H. & H.) pays $1.50 a day to the laborers and $60 a month to foremen. He also pays for all time over 10 hours.

In Mr. Bishop's remarks he had said that his road had recently bought a line in the state of New York, on which lower wages were paid, viz., $1.10 a day, and Mr. Kindelan asked if Mr. Dagget's road had also bought any $1.10 roads. It seemed to him that if the roads that paid the highest wages could buy out the others there must be a lesson in it.

There seemed to be nobody present who paid more than $1.10 a day, and Mr. Black, of the Manhattan Elevated, was surprised to know that trackmen could be got for such wages. He thought that it was proper that the managers of the railroads should know that good service could not be got for so little money.

Mr. Stearns and Mr. Ramsay protested that they had as good workmen in the West at $1.10 a day as there are in New England at the higher wages. Nobody suggested in the discussion that the cost of living in the two sections of the country made the difference in wages rather apparent than real.

Mr. Mead's amendment was carried, and the report was returned to the Committee to be revised and presented again Wednesday afternoon.

Mr. Doyle, Chairman of the Local Committee, announced a programme for entertainment, viz.: A general visit to the theatre Tuesday night, an excursion to Star Island Wednesday afternoon and to Niagara Falls Friday.

The convention then adjourned until 9 o'clock Wednesday morning.

EXHIBITS.

The Anderson Rail Joint, Chicago, a full sized rail joint.

Long Truss Rail Joint Co., Chicago, a set of Long Truss rail joints. This rail joint is one of the five recommended for trial and further report.

Rodger Ballast Car Co., Chicago, a model of the Rodger ballast car.

The Eureka Nut Lock Mfg. Co., Marshall, Tex., samples of Eureka nut locks.

Brenizer's Automatic Railway Safety Switch Co., Duluth, Minn., a model of a safety switch.

Jones' Safety Nut & Spur Lock Co., Syracuse, N. Y., samples of nut locks.

The National Surface Guard Co., Chicago, exhibited the well known iron surface guard illustrated in the *Railroad Gazette* Feb. 7, 1890, and which was adopted as a standard at the Denver Convention.

The National Lock Washer Co., Newark, N. J., samples of the National lock washer.

Standard Railway Rail Joint Co., Boston, samples of a continuous rail joint.

The McConway & Torley Co., Pittsburgh, Pa., samples of the Continuous Rail Joint. This joint was one of the five recommended for trial and further report.

Benj. Wollenhaupter, model of the standard cattle guard.

Kansas City Switch & Frog Co., Kansas City, Mo., blue prints of signals, crossings, rail braces, etc.

Ruffner & Dunn, Schuylkill Falls, Philadelphia, Pa., samples of the well-known Excelsior single and double automatic nut locks or fish plate springs.

Carlisle Manufacturing Co., Carlisle, Pa., catalogues and blue prints of frogs, switches and stands.

C. H. Dunham Railway Equipment Co., Chicago, three samples of Cloud double-angle or girder truss rail joint, which have been in service 18 months. This joint was one of the five recommended for trial and further report.

Bush Surface Cattle Guard Co., Kalamazoo, Mich., a model of the Common Sense Steel Surface guard.

The Bush Interlocking Bolt Co., Philadelphia, samples and photographs of the Bush interlocking bolt for bridges and track.

Dilworth, Porter & Co., Pittsburgh, Pa., samples of the Goldie spike.

Clark Fisher, Trenton, N. J., exhibited the Fisher track jack and several samples of his well known rail joint. This joint was one of the five recommended for trial and further report.

The Ionia Steam Hand Car Co., Ionia, Mich, exhibited a steam inspection car which had just returned from an inspection trip of 1,400 miles.

Dunham Manufacturing Co., Boston and Chicago, samples of their well known specialties for track.

Fairbanks, Morse & Co., Chicago, had a large exhibit, represented by Mr. Geo. A. N. Akers: One standard hand car; one Sheffield all steel wheel hand car; one Sheffield standard push car; one Odometer velocipede hand car, with a device for recording in feet the length of track traveled over, made by Sheffield Velocipede Car Co., Three Rivers, Mich.; one railway velocipede car, made by Sheffield Velocipede Car Co.; blue prints of water tanks, Dodge stand-pipe, etc. The Barrett jack and track tools.

Illinois Bolt & Nut Works, Chicago, samples of Champion bolt and nut locks.

Tallman & Co., Grand Rapids, Mich., exhibited the signal holder illustrated in *Railroad Gazette* Sept. 5.

Kalamazoo Railroad Velocipede & Car Co., Kalamazoo, Mich., a large exhibit of hand cars, velocipede cars, steam inspection car illustrated in *Railroad Gazette* July 25, and the steel surface cattle guard illustrated in *Railroad Gazette* July 18.

Andrew Warren, St. Louis, Mo., samples of railroad track tools.

McGrath & Finley, Toledo, O., a model of McGrath's automatically adjustable railway crossing.

Wier Frog Co., Cincinnati, O., blue prints and lithographs and a model of an automatic switch stand.

The Weber Rail Joint Co., New York, several samples of the Weber rail joint. This joint was one of the five recommended for trial and further report.

Several well known supply firms were represented, but had no exhibits. Among them, Elliott Frog & Switch Co., St. Louis, Mo.; Manning, Maxwell & Moore, New York, and the Berry Signal Lock & Target Co., Chester, S. C.

The Western Burnt Clay Ballast & Paving Co., Cameron, Mo., samples of burnt clay ballast.

Continuous Rail Joint Co., Newark, N. J., samples of a continuous rail joint.

A. L. Stanford, Evanston, Ill., the Stanford track jack and a new track drill.

The Giant Rail Splice Co., South Bend, Ind., a model of the giant rail splice.

R. E. Tilden & Co., Cleveland, O., samples of replacing frogs and a model of a new bridge guard.

The Shoulder Tie-plate Co., Philadelphia, samples of shoulder tie-plates.

The Positive Nut Lock Co., of Jeffersonville, O., samples of a new positive nut lock.

The A. J. Hartford Steel Railway Tie Manufacturing Co., New York, an improved model of steel tie.

Indianapolis Frog & Switch Co., Indianapolis, Ind., a model of the chance continuous rail crossing.

Chas. A. Gilchrist, Fort Madison, Ia., model of rail joint.

Ajax Forge Co., Chicago, Ill., Industrial Works, Bay City, Mich.

Buffalo Marine Fan.

The Buffalo Marine Fan illustrated herewith was designed especially for the West India fruiting steamer "Neptuno," and is placed in the engine room, arranged to exhaust the air from the ship's hold, where bananas and other fruits are stored.

It has been found that cargoes of fruit thus treated arrive in good condition, the loss from decay being far less than without forced ventilation.

In this instance, as in most cases of ship ventilation, it was desired to secure a certain amount of air at quite a pressure, when running the fan at a minimum speed; hence it was necessary to build out of regular proportions for ordinary work. Its peculiar construction results in obtaining 2½ oz. pressure at discharge, and in keeping up a circulation of air in every part of the hold.

Aside from a ventilator, the fan is arranged to serve as a blower for the furnaces, the air being forced through the stoke hole to the fires.

The fan replaces the air in the ship every minute and a half, and is operated by a double direct connected horizontal engine of 12 horse power. Each engine has a capacity to drive the fan independently. The fan and engines were made by the Buffalo Forge Company, Buffalo, N. Y.

Wooden Trestle Bridges.*

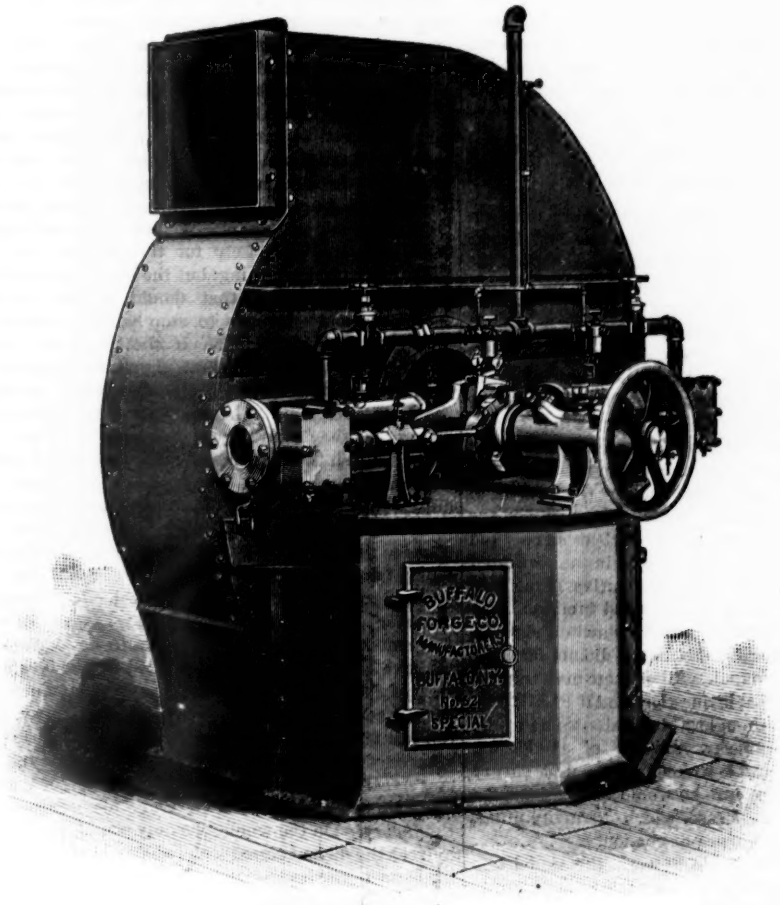
BY WOLCOTT C. FOSTER.

STANDARD DOUBLE-DECK TRESTLE—RICHMOND & DANVILLE RAILROAD.

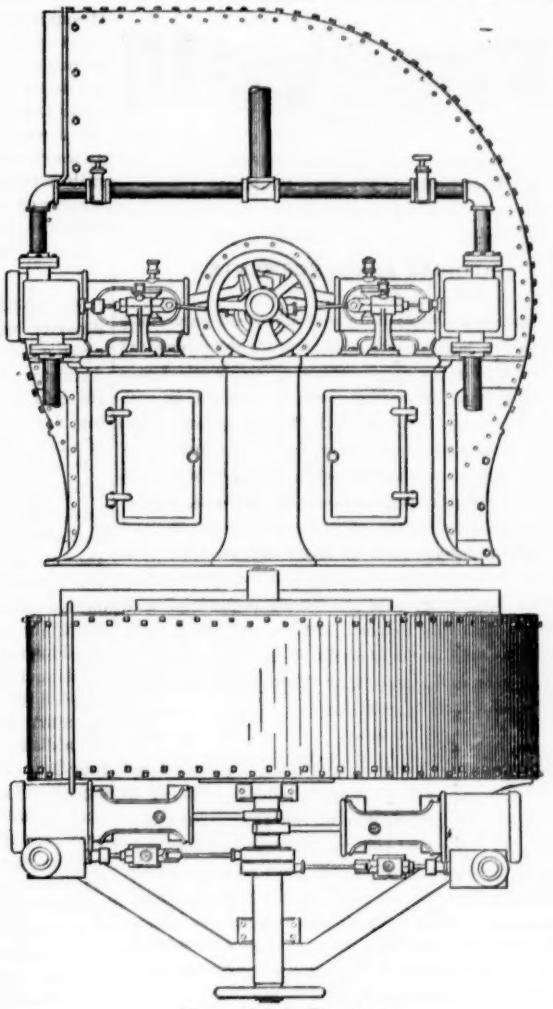
The accompanying cut represents the standard plans for double-deck trestles as adopted by the Richmond & Danville Railroad—Mr. Channing M. Bolton, Chief Engineer.

This design belongs to a class of which we have already

* Copyright, 1890, by W. C. Foster, and condensed from his forthcoming book upon the same subject.



Perspective View.



Plan and Side Elevation.

BUFFALO MARINE FAN.

Made by the BUFFALO FORGE CO., *Buffalo, N. Y.*

given one example—*i. e.*, multiple-deck trestles, in which the decks are entirely separated from each other by purlins. In detail, however, it differs very materially.

The floor system is a very fair one. It would, however, be somewhat improved by making it wider by lengthening the ties and cap. The guard rails are 8 in. × 8 in., notched 1 in. over the ties, which are 8 in. × 8 in. × 10 ft., spaced 15 in. centre to centre. The ties are supported on track stringers composed of two pieces of 7-in. × 14-in. timber and jack stringers composed of one piece of the same size material. The floor system is held together by a bolt passing entirely through the guard rail, ties and jack stringer, and is fastened to each bent by a bolt passing through the centre of each cap and the tie immediately above it. The stringers are all notched 1 in. over the caps. A spreader of 2-in. × 4-in. material is spiked to the under side of some of the ties to hold the track stringers apart.

The caps are but 12 ft. long, and are connected to the posts by mortise and tenon joints. The plumb posts are rather widely spaced, being placed 6 ft. from centre to centre. The upper ends of the batter posts are placed close to the plumb posts. They are also of smaller section than the latter.

The intermediate sills are cut 4 ft. longer than out to out of batter posts. The posts are joined to the sill in the same manner as they are to the cap; that is, by mortise and tenon.

The purlins separating the upper and lower stories extend over two bays. They are 27 ft. long, of 10-in. × 12-in. stuff, and alternate pairs lap on the same bent. When there is no lap a piece 10 in. × 12 in. × 2 ft. is inserted to give the same bearing.

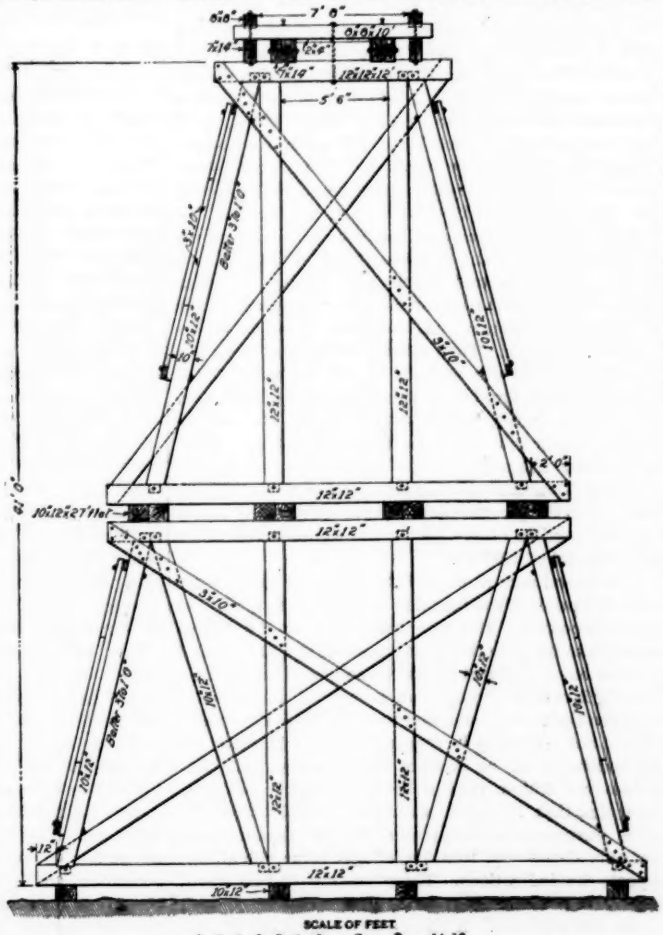
The cap of the lower story is of the same length as the sill of the upper one. The main posts are the same as those of the upper bent, but are reinforced by counters having an inclination in the opposite direction to that of the batter posts. The counters are also of the same section as the batter posts, *i. e.*, 10 in. × 12 in. The main sill is 12 in. × 12 in. × 2 ft. longer than out to out of batter posts. All of the posts, both main and counter, are joined to the sill and cap by mortise and tenon joint. The entire trestle is supported on subsills 10 in. × 12 in. laid flat when the nature of the ground permits of this kind of a foundation.

The sway bracing throughout is of 3-in. × 10-in. plank fastened at each intersection by three 7-in. spikes. The longitudinal bracing, which is diagonal, is also of 3-in. × 10-in. plank, but is bolted to the posts by ⅝-in. bolts rather than spiked.

Two-deck trestles are built only when posts cannot be obtained long enough for single deck.

The specifications for timber call for unbled, all heart yellow pine, free from wind shakes, defective knots and other imperfections, and subject to thorough inspection.

Following is a bill of material:



DOUBLE-DECK TRESTLE—RICHMOND & DANVILLE R. R.

BILL OF TIMBER.*

Name.	No. of pieces.	Size.
Floor system.		
Guard rails	2	8 in. × 8 in. × — ft.
Ties	..	8 in. × 8 in. × 10 ft., 15 in. c. to c.
Track stringers	4	7 in. × 14 in. × — ft.
Jack stringers	2	7 in. × 14 in. × — ft.
Spreader	.	2 in. × 4 in. × 3 ft. 9 in.
First or top deck.		
Cap	1	12 in. × 12 in. × 12 ft.
Plumb posts	2	12 in. × 12 in. × — ft.
Batter posts	2	10 in. × 12 in. × — ft.
Sill	1	12 in. × 12 in. × — + 4 ft.
Sway bracing	2	3 in. × 10 in. × — ft.
Second or lower deck.		
Cap	1	12 in. × 12 in. × — + 4 ft.
Plumb posts	2	12 in. × 12 in. × — ft.
Batter posts	2	10 in. × 12 in. × — ft.
Counter posts	2	10 in. × 12 in. × — ft.
Main sill	1	12 in. × 12 in. × — + 2 ft.
Sway bracing	2	3 in. × 10 in. × — ft.
Purlins	..	10 in. × 12 in. × 27 ft.
Sub-sills	..	10 in. × 12 in. × — ft.
Longitudinal braces.	8	3 in. × 10 in. × — ft.

Treenails for mortise and tenon joints.

BILL OF IRON (PARTIAL).

Name.	Number.	Size.	Use.
Bolts	.....	.....	Guard rails to jack stringers.
Bolts	.....	⅝ in. × 18 (*f*) in.	Packing bolts for stringer joints.
Bolts	1	— × 36 in.	Floor system to caps.
Bolts	8	⅞ in. × 19 (*f*) in.	Longitudinal bracing to posts.
Spikes	81	7 in.	Sway braces to posts, caps and sills.
Spikes	.....	.	Spreaders to ties.
Cast washers	.....	.....	Under bolt heads and nuts.

For the Home Market.

A few months ago two German associations of iron and steel manufacturers addressed to the German minister of public works a request that the importation of wooden ties for railroads be restricted, and that the deficiency in the supply be made up by the more extended use of iron ties. It was pointed out that of the 3,464,348 wooden ties used annually on Prussian railroads, about 1,800,000 are imported, and that the purchase of these is consequently of no pecuniary benefit to German lumber men. If these 1,800,000 ties, however, were made of iron, there would be an increased consumption, annually, of about 99,000 tons of iron which could be supplied by the home market and which, thus, would directly benefit the German iron industry. The German taxpayer's side of the matter is not presented in this request, but as the state owns most of the railroads he would be much interested.

* Dimensions marked — are variable; those marked — + are variable, plus a constant.

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The first day's proceedings of the convention of the Roadmasters' Association at Detroit were uncommonly interesting, particularly the report and discussion on the education of section foremen. The proposition that the fundamental reform must be made in the wages paid was repeatedly made and always applauded. There did not seem to be any difference of opinion on this question, and perhaps what was said will have a little effect; but unfortunately this is not a good time to recommend a voluntary increase in wages. The uncertainty as to what the roads will be allowed to earn is too great. With a scanty or precarious income managers feel obliged to refuse an increase of salary, even when they know that it will pay, *eventually.*

The report of the committee on joints is a good start. The only way for the Association to get at any results that will command respect is to make careful trials of some of the new forms. It has heretofore confined its official attention to the angle splice. We should have recommended at least one other joint for trial, but it seems that the inventor did not furnish the committee with any information. The joints recommended for trial are probably all, or at least all but one, pretty well known to our readers, and all have merit. But we have seen the rise and fall of too many joints to predict, on theoretical grounds alone, the success of any one. Only trial in the track can demonstrate that a new joint, obviously meritorious, will survive; but it needs no trial to show that nine-tenths of those offered will not survive.

One of the most important matters left over from the DenverConvention made no progress this year; that is, the revision of the constitution and by-laws. It is particularly important that something should be done to get more and better reports. This year the topics for report and the committees were selected as late as the end of May. Consequently, the reports were hurried at best, and at least one committee made no report whatever. Of course, there was no time for sending out advance copies to get discussion. It is surprising, under the circumstances, that the reports and discussions are as good as they are.

We have lately heard of dangerous fractures of new steel rails on two different roads, one East and the other West. The fracture starts in the flange, goes up through the web, and then follows along under th head of the rail for a foot or two before breaking through. One rail is 50 carbon; the other is hard, but we do not know just the amount of carbon. In both cases the rails are new and of particularly fine finish. They were made at different mills. The mill men are as much at a loss to explain these fractures as are the railroad engineers. If any of our readers have had similar experience we should like to get the particulars.

The Office of Distant Signals.

An intelligent correspondent, who is more than ordinarily well informed in signaling matters, brings up in a letter printed on another page the theory of the distant switch signal and of distant signals in general. His misconceptions of elementary matters are surprising, and have led us to think that a short discussion of a few first principles may be useful to others.

P. S. E. is not simply "hypercritical" about the Pennsylvania signals, but he fails to grasp the facts of the case which he criticises. The distant switch signals on the Pennsylvania lines were designed to be used as absolute *stop* signals and not as cautionary signals. It was the theory that any train finding this signal at danger should stop, and that a train destined for the siding should only proceed under a clear signal and should not pass this signal when it stood in the horizontal or danger position. Hence a distinctive name was adopted for the signal, its position and function being peculiar. It was called an auxiliary switch signal—not a distant switch signal—because it did not have the functions of a distant signal. All of these matters were explained in the editorial in question, and if P. S. E. had read it carefully and thought a few minutes he would have seen that his hand-saw method of elucidating matters was not applicable so long as the first theory was adhered to. To be sure he would have missed the chance to turn a smart phrase, which to many minds is one of the chief delights of discussion.

It was found impracticable to work this signal as a positive stop signal because it was placed so far away from the switch that the men would run past it in spite of orders. This fact has a lesson for signal engineers, but it has nothing to do with the name given to the switch signal. The break down of the first theory of these signals might, perhaps, have been foreseen. Probably it was considered and discussed from the first; but it could not be said without actual trial that it would not work. Only a recluse can be absolutely cock sure of the completeness of the rules of conduct which he evolves. The man who applies rules to practice discovers the limits of pure reason as a human tool, and is not always sure he is right till he has tried.

Our criticism of the use of a red, square end blade for a distant switch signal was based upon the fact that it led to running past a *danger* signal; and that is radically bad practice. If the theory of the distant switch signal as formerly used on the Pennsylvania lines and the Erie had worked; that is if the signal had been always respected and treated as a red signal should be, the practice would have had some advantages. It would have given more complete protection for the fast and heavy trains. Let us suppose that a long freight train is crawling into an outlying siding protected by a distant switch signal; that the approach to this siding is around a curve in a cutting, or otherwise obscured, and that the flagman has not got back a sufficient distance. All of these conditions are common enough. Then a heavy passenger train approaching at 60 miles an hour would be safer if the distant switch signal were an absolute stop signal than if it were a caution signal, simply because the chance of stopping in time would be increased by the more imperative character of the signal received by the runner. Doubtless it was such considerations as this that led to the practice now abandoned on some roads, and still used on others, but which we objected to in the editorial of July 25.

The second paragraph of P. S. E.'s letter shows some misconception of the function of a distant signal, but is partly correct. It is true that the office of a distant signal is to indicate that a positive signal will be found further on, and that it should be so placed that a train passing it can be brought under control in the space between the two signals, and that therefore the runner should not ordinarily be required to have his train under control when he reaches the distant signal. But it does not follow that if he is required to be under control at that signal a plain post would answer the same purpose as a semaphore; for the distant signal not only shows the location of the home signal, but repeats its indications. Therefore the distant signal must give two distinct orders: Proceed under control, or proceed at speed. A plain post could give but one. All this is elementary, and we wonder that P. S. E. should not have thought of it. He certainly knew it years ago.

We said that our correspondent is partly correct. Speaking generally it would be unreasonable to require an engine driver to have his train under control on arriving at a distant signal. In thick weather he could not always; and the greatest use of distant signals is to make high speed possible in thick weather. On the other hand it would be unreasonable to say that the process of getting under control need never begin until the signal post is reached. This must depend upon the speed and weight of the train, the condition of the track and the available braking power. Distant signals are so placed that they can be seen from a distance precisely for the purpose of giving the runner ample warning; but the home signal is the one to *stop* him and all that should be asked of him is that he should be able to stop without fail before he gets to the home signal. If the weather is thick and he cannot see the distant signal till he gets to it then the operation of getting under control must be the more energetic; or he must run slower until he knows that the distant signal is clear.

The English Clearing House code says that "when an engine driver finds a distant signal at 'danger' he must immediately reduce the speed of his train so as to be able, in case of need, to stop at such signal, but if he see the way clear he must . . . be able to stop short of any obstruction between such signal and the home signal. . . ." This rule, which is essentially the same as that of some American roads, embodies a different theory of the distant signal from that which we have advanced, and it is founded on the inconsistency of making a stop signal of one which, under unfavorable conditions, could not be seen 100 ft. away. To run fast trains on schedule time, under such a rule, in a fog or of a thick night, would require preliminary distant signals to give warning of the indication of the distant signals—and so on, as far as one chooses to carry the theory. On the whole, the only sound practice is to treat the distant signal simply as what it is, viz.: an auxiliary to the home signal, the office of which is to make sure that trains can always be stopped at the home signal.

The point immediately essential in the Erie matter is, that every one using such a signal, or in any way concerned with it, shall clearly recognize that it partakes of the nature both of a distant signal for the switch and a block signal for the trains standing between it and the switch. If it is painted green, with a notched end, it proclaims itself as a caution signal; and its use as a stop signal, which the Erie rule really makes necessary in foggy weather, must therefore be enforced wholly by the rules, and contrary to outward appearances. This double use is objectionable, and to this extent we agree with our correspondent.

A Really Inexcusable Accident.

One of the most inexcusable collisions that we have heard of lately was that at South Norwalk, Conn., on the night of Sept. 6, when a westbound New York, New Haven & Hartford passenger train, about an hour behind time, ran into the side of a Danbury & Norwalk passenger train as the latter was crossing the New Haven track. Happily, the personal injuries were very few. The Danbury train had been over to the south main track of the New Haven road to get some through passenger cars from New York, and was returning to its own track. This movement was made by means of a crossover and switches, and yet the conditions at this point are practically the same as though it were a crossing. But, notwithstanding this, there are no interlocked signals, either home or distant, and the only protection to the approaching train in this instance was an ordinary red light in the hands of a brakeman. Unfortunately, it was not kept in the hands of the brakeman long enough; he expected no train, and so set the lantern down on the track and went off to one side. Just then the train came along and the cow-catcher touched the lantern before the engineer knew there was a lantern there. These are the facts as we learn them from a reliable source.

Now, of course, the prime fault lies with the engineer, who, as he was turning a curve to the left, should have crossed over to the fireman's side of the cab so as to get a good view of the line. It is not positively stated that he did not thus cross over, but we will not credit him with that excessive degree of negligence that must be assumed if we admit that he was on the inside of the curve and still did not see the red light. The brakeman must have been lazy, or worse, not to swing his light when a train was approaching, and so must be blamed along with the engineer and fireman. Quite likely the rules of the road may not warrant any censure of the fireman, but we think there is much force in Major Marindin's dictum

that "the fireman ought to have been looking out for signals . . . on approaching a junction." If the fireman had been killed we think he would admit the force of that rule, too (if this is not a Hibernicism).

But beyond all this, this is a case where the failure to provide a fixed signal is especially flagrant because of the surroundings and the general reputation of the road. The Norwalk drawbridge is only a few rods east of this point and is equipped with semaphores. This has a tendency to encourage the feeling on the part of engineers that adequate signals are provided, and increases the surprise of observers that the crossing as well as the bridge is not signaled. The block system is used on the whole of this division, the blocks being 2 and 2½ miles long. A road which thus shows intelligence in adopting the most approved provisions for safety seems all the more blameworthy when a glaring omission like this is shown up. Many experts would state this more positively, claiming that a road had better completely protect a short section of its road than partially protect a longer piece. American travelers read that the English roads have block signals on 90 per cent. of their double track lines, and that a similar percentage of switches is interlocked with adequate signals. This fact is coupled with a record of unexampled safety to passengers and property. Now, when a person with these points in his mind rides over the New York, New Haven & Hartford, and sees the fine condition of the track and rolling stock, the new and substantial signal towers, and other signs of prosperity, he quite naturally assumes that he is riding under all the protections afforded by the best English roads. The perpetuation of old methods among surroundings so different is not only unprofitable to the road but deceives the passengers. We spoke of equipping a short section of road when the equipment of a longer section was impracticable. That consideration, however, deserves no mention when speaking of a road which constantly pays 10 per cent. dividends on its stock and has no excessive debt; and it is therefore out of place in this discussion.

Concerning Passenger Stations.

The English passenger station illustrated on another page is noticeable chiefly because it is an "island" station and by reason of its easy stairs. Island stations were formerly somewhat common in this country, but are probably less favored now. This is, of course, because we built them on the same level with the track and thus made the platforms convenient to the trains at the expense of the street approach. With an overhead station, the necessity for only one flight of stairs, the economy of room and the other conveniences, the advantages of this plan are manifest. To change an ordinary to an island station involves, generally, a quite extensive rearrangement of tracks, especially if there be many side tracks near, and additional land would often be necessary. Near large cities, where a four-track line must be taken into account as a future possibility, if not as a present necessity, as is the case with some roads already, this problem requires broad treatment, for the whole of the stations on a division ought to be of the same character. If way trains use the two inner tracks all stations must be of the island form, while if the local business is done on the two outer tracks none of them can well be arranged that way. The Boston & Albany plan of using the south pair of tracks for way trains and the north pair for expresses works well where the through trains make no stops at all on the four-track road, but it is evident that, with either this plan or that employed around New York and Philadelphia, a station where some of the express trains stop, but most of them do not, presents quite complicated conditions. The most comprehensive scheme is, doubtless, that which provides abundant crossovers at all important stations (these switches being completely signaled) and thus admits of trains being readily transferred without delay from one track to another. The Pennsylvania is gradually introducing this system and, we understand, with great satisfaction. By perfecting the block and interlocking signal arrangements so that one train can be held for or run around another without issuing a written order to the conductor in each case this becomes in many respects the ideal method of handling trains.

Whatever the situation of an overhead station, the stairs should be made not only easy, but, if possible, very easy. Great care should be taken to carry out this idea to the fullest possible extent. Every six inches saved represents many thousands or millions of foot-pounds (in a double sense) saved yearly, and steps that are not saved, but are merely disguised, also save a similar quantity of mental energy. If one step out of a dozen is removed from the other eleven far enough to give ascending passengers a breathing spell of two seconds in the interval, much inward blasphemy among rheumatic old fat men is prevented. For these reasons the "booking office" floor of a station like that at Southfield ought to be dropped a foot or two below the street level in order to change part of the steps now on the lower side to the upper side of that room. In the same way, the floor of an ordinary station (where there is no overhead street bridge, and where a foot bridge has to be built), ought to be considerably above the rails, so that the lift to get across the track will not be abrupt, and have to be undertaken all at one effort. It is a pity that people are so averse to using underground passages, and that they cost more than foot bridges. As the tallest man requires ten or a dozen feet less head room than the highest locomotive or car, it will always be decidedly easier for people to go under tracks than over them. It is to be hoped that the art of keeping subterranean passages dry and odorless, and of artificially lighting them so as to induce people to forget their sepulchral notions concerning them, will be perfected so as to bring such crossings into more general use.

Although it seems to an American quite extravagant to arrange the rooms at a small station in such a manner that from three to six individuals will always be needed to properly man the station, even for the minimum amount of business, it is to be remembered that the right arrangement of such stations is by no means universal on this side of the Atlantic. The English roads can afford to have a signalman, a gateman, a porter, and so on, ready for duty at all necessary hours. We must get along with fewer men, and we accordingly arrange our ticket, telegraph (and signal), and baggage rooms near together. But a point often forgotten, or neglected, is that many a station which is a large one in the day time becomes a small one at night. The above mentioned rooms are placed close together at the smaller towns, but not at the medium sized ones; and the latter therefore become, for night trains, less convenient for passengers than the former. At a little country town in Illinois a traveler can be as well served at midnight as at noon; but at a city of 10,000 inhabitants in the East he will find the ticket office closed or the baggage agent tending switches, or encounter some greater inconvenience. The telegraph office should adjoin the ticket office, so that on nights, Sundays and holidays one man can attend to both with facility. If the same man has to check baggage he should not be compelled to go 40 or 50 rods to get a check or a truck. If he has to attend a crossing signal he should not be compelled to leave his office at loose ends while he runs out in the snow to pull the semaphore. Not all these desiderata can be accomplished without some little expense and calculation, but it pays to take account of them and to exercise forethought in the matter.

A Case for Standard Locomotive Tests.

Last week we gave an account of the tests of the Baldwin four-cylinder compound on the Baltimore & Ohio Railroad. Aside from the results of the tests, they indicate some of the necessary conditions and what is the necessary apparatus to get a complete and satisfactory test of a locomotive in service. The results obtained, while being in a practical sense comparable for the two locomotives tested, are not of a nature to be satisfactorily compared with other locomotives on other roads. For instance, we have no means of comparing this compound locomotive with that on the Michigan Central, or with the Webb compound on the Pennsylvania. Neither is there an opportunity to compare the action of the simple engine with other simple engines which have been tested.

The most important information lacking is the actual work done by the locomotive. To supply this, a dynamometer car must be used. For instance, if the coal consumed and the water used were given in pounds per horse power per hour of actual work done at the drawbar, then they might be compared with similar results that are on record and which will be obtained in the coming year from several experiments that are now contemplated. Horse power, figured from indicator cards, taken only at intervals, in the case of a locomotive which varies in speed and in which the cut-off is adjusted from time to time, and where the boiler pressure varies continually, is but a poor indication of the amount of work done. This is particularly evident in the case in point where the engineer controlled the throttle regardless of the stage of the experiment. If it were convenient to take a continuous indicator card, the possibility of which is beyond question, such a continuous diagram would give results more satisfactory; and in any case if the indicator is to be relied on for an estimate of the work done, cards should commence when the train starts and not end until the engine stops. The average indicator work on a locomotive is of little value in the matter of power except to show the maximum and to give a fair idea of the average. It does, however, furnish information of great value relative to the condition and action of the valve motion, the back pressure, wire drawing and compression, and these are all points that must necessarily be investigated; but the fundamental problem with railroads is to determine how much work is done with a given amount of coal.

Water measurements are absolutely essential, but all errors and uncertainties of measurement must be avoided. While tank measurements by water glasses answer very well to give a general idea of the amount of water used, and to furnish a check on other measurements, yet these should not be relied upon in making a scientific test. Of course water measurements made from the tank are easier than any other kind; but a locomotive test should not be hampered by any attempt to reduce reasonable cost or trouble in making it. It is not an easy matter to measure the water in any other way than by tank measurements, but surely there is some way of doing it. In fact, there are several water meters in the market now, which the manufacturers think will give good results in locomotive tests. We are not sure that this has been proved for any water meter, yet it is readily seen that if some measuring instrument of this sort were placed on the suction pipe of the injectors and a careful account kept of the water wasted at the overflow, there would be a direct indication of the amount of water fed into the boiler wholly independent of the amount used to wet the coal, to blow out cinder and for washing purposes.

But even an accurate water measurement is not all that is required to give an idea of the economy of the engine. It must be known exactly how much water is evaporated into steam, and to do this either the locomotive must be run in such a way as to always furnish dry steam—and this is next to impossible with some designs—or otherwise some satisfactory form of calorimeter must be kept running at all times during the test to show changes in the moisture in the steam which take place when the water level changes, or when there is a change in the velocity of ebullition, a change in the grade of road, or a change in the demand for steam. Without a measurement of this sort a locomotive test can only be made of the whole combined engine; and a bad boiler, or one with scale, connected to a compound engine, might wholly overcome the saving of compounding, and show the locomotive to be inferior to many simple engines. Also, the engineer might carry the water several inches higher in one boiler than in another; and two engines exactly alike in construction might give entirely different results.

If there is truth in the results of investigations which have been made to determine the effect of boiler scale and sediment on the efficiency of a boiler, then there is every reason for testing a locomotive in such a way that the individual action of the boiler can be determined separately and independently of the efficiency of the engine as a whole, because it is easily possible to materially affect the economy of a boiler by allowing a small deposit of scale to collect on the interior. The calorimeter showed during the Baltimore & Ohio tests that the steam was practically dry; and while there may be several ways of accounting for absolute dryness in this particular instance, yet there are perhaps two reasons more important than the others. One is the large steam space in the boiler, and its good design generally, and the other the excessive wire drawing between the boiler and calorimeter caused principally by throttling.

The Barrus calorimeter used in these tests is the best yet proposed for locomotive work; and while it has been thoroughly tested in stationary work and shown to be sufficiently accurate for locomotive work, yet some investigation should be made of its action under the conditions in which it is used on a locomotive. In stationary boiler experiments entrained water often appears with the steam; and while we do not question the action of this device in the B. & O. tests, yet it is somewhat surprising that no water appeared in any of the experiments. It may be—surely it is possible—that the locomotives tested do not under any condition furnish wet steam; and if this be so, then they are decidedly in advance of many others. In some instances, with other designs, the amount of moisture in the steam has been enough to require careful attention on the part of the engineer to keep down the water line in the boiler to prevent "knocking" in the cylinders when the engine is working hard. Sometimes, also, water appears at the top of the stack in quantities visible to the eye: but this is rare except at starting.

With this wide variation in conditions before us—realizing the uneconomical action of a locomotive boiler which gives out entrained water with the steam—there is great necessity for the use, always during tests, of some device, such as the Barrus calorimeter, with which to measure the exact character of the steam passing through the throttle.

The Baltimore & Ohio series of tests furnishes sufficient illustration of the great need for the work which the committee appointed by the American Society of Mechanical Engineers has undertaken. The recent tests are an example in point; they were most important, and every one interested in the advancement of the locomotive in this country has been looking forward to the results for either corroboration or refutation of pet theories and arguments. An able engineer was employed to do the work, and it was done after the usual manner of making such tests, with the addition of several decided improvements; and yet in spite of the interest of the able experimenter and the railroad company and the Baldwin Works, we still lack the most important information which we should have had if a set of standards had been adopted and followed. That is, the exact amount of water evaporated into dry steam per pound of combustible burned in the furnace, and the amount of dry steam used per actual horse power developed. This data is essential in order that exact comparisons may be had with other tests to be made in the future and to furnish approximate comparisons with tests that have been performed where the actual horse power has been determined. Also it is most desirable that a definite idea should be obtained of the performance of a locomotiue when compared to a stationary steam plant in order that some basis may be had from which to work in making estimates of comparative efficiency of electric and steam railroads.

We do not wish to appear as criticising these tests. Rather, we wish most emphatically to say that the work was excellently done; but the fact remains that the results are not those that must be had in order to make that step in advance which must follow the present close competition in railroad transportation, demanding as it does all possible saving and the use of the most economical rolling stock. Locomotive designs are so varied and so widely different that it is not possible that all should be within a permissible range of economy, and there will sooner or later come a time when the best will be selected, a few ruling types be adopted, and the advantage of reasonable uniformity be gained. Then there is also the question of compounding to be settled. Therefore, taking all together, a scientific basis of comperison is essential that the real value of the contradictory types of engines now in use may be put before railroad men in a proper light.

The General Manager of one of our largest railroads writes as follows: "I have just read your excellent article of Sept. 12 on the importance of having good division superintendents. . . . The Division Superintendent is the foundation of the official structure, and, as you say, if he is not of the right material, all that rests upon that foundation must necessarily be unstable and of doubtful benefit. I can recall instances where locomotive engineers have made as much money per month on their engines as was received by the Division Superintendent, but the manager was powerless to remedy the inequality. No good business man operating a manufactory would pay his superintendent, overseeing a hundred men, lower wages than he paid the men themselves, and still expect him to achieve success or produce satisfactory pecuniary results. There is no doubt that much good comes from the hold that a Division Superintendent gets by a long personal acquaintance with his men. Too frequent changes of location among division superintendents are to be deplored. The pay should be made attractive and the position permanent, and the public and the corporations would undoubtedly be better served than under present methods. Putting the right division superintendent in the right place is of more interest to the community that a road serves, and to its stockholders, than the presidency. I know of no vocation in life in which the same amount of labor and attention to details does not produce better financial results, and so long as this is the case able men will drift into other channels, where they can get better remuneration. It is a thousand pities that the ownership of roads cannot be so held as to have more personal interest taken in their organization and operation, and the success of the management tested by longer periods of operation, rather than by the cold figures of the balance sheet for a few weeks or months. While the latter may produce results which are temporarily satisfactory, those results cannot be lasting unless founded on justice and common sense."

The largest crane in the world has been erected in the Washington navy yard. It was rated as 110 tons, and has been tested to 123 tons. The test was made recently in the presene of the Secretaries of War and Navy and other government officials. It was described and illustraed in some detail in the *Railroad Gazette* of June 20 last. The design was made to carry the 110-ton steel guns which are being built by the government. The hoisting machinery is a mass of ponderous gear wheels and chain drums, and travels back and forth on the tracks on the steel girders with little noise. An idea of its immense proportions may be obtained from the weight of the pulley block which hangs below the crane. This alone weighs five tons. In addition to this mammoth carrier there are a 40-ton and a 25-ton crane in the gun and carriage works, and another of 15 tons is soon to be erected. These cranes were all made and designed by the Morgan Engineering Co., under the superintendence of Mr. John R. Morgan. The large crane required two years to build, and cost the government, together with the iron framework upon which it is supported, $200,000.

Annual Report.

Old Colony.—The Old Colony occupies among railroads an exceptionally favorable position. It is strictly a local road, the traffic of which no competitor (if it has any such) can steal away. A large through business permits economies to be made which reduce the expenses per unit, but still the expense per ton mile is high as compared with that of a road having longer lines. Nevertheless this road can charge—particularly on freight—such tariffs as would make a Western manager sigh with envy. The road hauls its average ton of freight about 36 miles only, in train loads of but 80 tons, but at an average charge of 2⅜ cents per ton mile. It carries 73 passengers to a train an average distance of 11½ miles at an average fare of 1.8 cents per mile. Its bonded debt per mile is about the same as that of the Boston & Albany, its stock is about half, while its net earnings per mile amount to about one-third of those of the Boston & Albany. Dividends of 7 per cent. were fairly earned last year after liberal expenditures on bridges and buildings, maintenance of way and structures figuring out about $2,400 per mile. There were issued during the year 4,000 shares of stock, which were sold at auction, bringing a premium of $235,930; also $500,000 of 4 per cent. bonds, these also at a premium of $64,800. These amounts and the surplus for the year of $107,615 are credited to the improvement account, to which are charged such items of construction as the directors do not wish to pay from bonds or from current revenue. These items consist principally of new equipment, new stations, second tracks and cost of ten grade separations ($34,107), total $304,000. The cost of new branches, $883,185, was paid from bonds and stocks sold.

The statement is:

Gross earnings:		
Passengers		$4,541,061
Freight		2,999,411
Miscellaneous		1,479,823
		$8,020,295
Operating expenses:		
Maintenance of way		$1,343,430
Maintenance of equipment		796,624
Conducting transportation		3,103 956
General expenses		282,848
		$5,526,859
Taxes		433,580
		$5,960,439
Net earnings		2,059,855
Dividends received		135,723
		$2,195,578
Rentals	$884,605	
Interest	658,675	$1,243,280
		$952,298
Dividends, 7 per cent.		844,683
Credit to improvement account		$107.615

It is an unusual thing to find the passenger receipts of an important system nearly double the freight earnings. The report speaks of the large amounts spent to put the property in good condition, the Boston & Providence when leased not being up to Old Colony standard. President Choate says the operating expenses, exclusive of improvements, should hereafter be not more than 65 per cent. of the gross earnings.

The Fall River steamboat line paid 10 per cent. dividends.

The report closes by mentioning the Quincy accident, but does not attempt to give the cost to the company.

NEW PUBLICATIONS.

Geological Railway Guide. By James Macfarlane, Ph. D. Second edition, revised and enlarged. New York: D. Appleton & Co. 1890.

This work gives in a very condensed form the geological formation and the altitude above mean tide water at every railroad station in the United States and Canada, with more extended notes concerning places of special interest. The introduction gives brief descriptions of the various formations. The first edition was published in 1878. This edition has been nearly doubled in size and the list of altitudes is entirely new. It is edited by the son of the author, Mr. James R. Macfarlane. It is intended as a hand-book not only for the student and geologist but for the traveler who wishes to while away the hours of a railroad journey and at the same time accumulate some valuable information. The railroads are classified by states, and for each state the notes have been prepared by, or under the direction of, the State Geologist or other local expert. The usefulness of the book is greatly increased by a good alphabetical index.

Paving and Municipal Engineering.—This is a monthly journal published at Indianapolis, Ind., William Fortune, editor. The subscription price is $1 a year, and such issues of the paper as we have seen indicate that it will be well worth the price to anybody interested in the subjects of which it treats.

The Western Railroads and the Interstate Commerce Commission.

[From an Occasional Correspondent of the Railroad Gazette.]

Press dispatches this week have announced the adoption by all of the railroads of the Western Traffic Association (except the Rock Island and the Alton) of resolutions providing for the making of the reduced rates on corn, recently ordered by the Interstate Commerce Commission, so far only as is necessary to meet the making of such reduced rates announced by the two latter roads, to take effect Oct. 1, and agreeing to maintain the present tariff rates in all territory not competitive with the Rock Island and the Alton. This decision, which is apparently final, affords occasion for a review of the situation under which this action has been taken on the part of all roads west of Chicago, except the two above mentioned.

In the first part of the fiscal year ending June 30 last the condition of the western roads was fairly satisfactory. Under the restraining influence of the Interstate Commerce Railway Association rates were reasonably well maintained. The crops of 1889 were good, and the corn crop in particular was immense. The volume of traffic increased during the fall and winter and the tonnage for the [calendar] year was unusually large. Various causes, however, effected a breaking down of the rates during the winter months, so that the large business of the spring was, to a considerable extent, non-remunerative. The Presidents' Association was weakened by several withdrawals. The westbound rates on merchandise were affected by contentions at St. Paul with the lake and Canadian lines and were materially reduced at all Missouri River points. The rates on lumber and salt were forced down to exceedingly low figures. The eastbound rates on live stock and its products were cut in half. The Passenger Association was dissolved Jan. 1, and as a consequence the passenger tariffs in May were merely nominal. The result of the foregoing and other conditions was that, while the business of the year showed large gross receipts, the net revenues of the lines were not proportionally increased, and the outlook in the month of May was anything but encouraging.

The reduction of rates is an easy matter, as each line has the right of independent action to which all competitors must conform. The restoration of war rates to a normal basis is a matter of extreme difficulty, as all lines interested must concur. The low rates had been made by the action of one line after another at one and another point and on one and another kind of traffic, with the general purpose of preserving business to lines which found it leaving them, and naturally it was hard to advance rates reduced for such a reason without the establishment of some assurance that all the lines should participate to a reasonable extent in all the traffic in competition.

A long series of meetings and conferences were held, extending through several months, at which every effort was made to find a basis upon which the lines could unite in the re-establishment and maintenance of reasonable rates. These conferences were finally crowned with apparent success. The passenger rates were restored through the formation of a new association, of which Mr. J. F. Goddard was made chairman. The class rates on general freight and the rates on live stock, packing-house products, lumber, salt, etc., were advanced in August to a point only a little below the figures of August, 1889. The volume of traffic continues fairly good, and encouragement was felt that the arrangement made, under which a fair proportion of business was expected to be distributed among the different roads at Kansas City, would be adequate to prevent the further cutting of rates. The partial restoration of tariffs has apparently been recognized by the public as entirely fair and right, and the importance of stable and equal rates, rather than exceedingly low rates, seems now to be more generally appreciated than ever before.

Meanwhile another series of transactions has been taking place with relation to the rates on grain, which, of course, is by far the most important article of traffic to the Western roads. During last winter the effort to suddenly market the enormous grain crop was followed by unprecedented reductions in the market price of corn. The roads were appealed to for relief, and voluntarily reduced their corn tariff 10 per cent. from points throughout the states of Nebraska and Kansas. The Senate of the United States took up the subject, and directed the Interstate Commerce Commission to investigate and report. This investigation was conducted during the spring. Meanwhile commercial causes came to the relief of the corn-producing states, and the price of corn was gradually and rapidly advanced until it is now about three times what it was in February; while the diminished crop of 1890 promises a continuance of the higher

prices to the producer and a largely reduced tonnage to the roads. At the present tariff rates and with the maintenance of present conditions the current year apparently promises returns to the Western railroads not substantially different from those of the last fiscal year; but with heavy reductions upon many of the important staples, results may be reasonably apprehended of a nature to compel the managers of the roads to treat the question of grain rates with the utmost conservatism and care.

Some time in June the Commission published its report to the Senate containing an announcement that it would order a large reduction in all the grain tariffs west of Chicago, ranging from about 10 per cent. on corn to about 30 per cent. on wheat, and including oats, rye and barley. So far as could be perceived from the report, this recommendation was based on the conditions that had existed in March and the early part of April, when the testimony was taken. It was an entire surprise to all the roads, for the investigation had been understood as conducted under the Senate resolution, and not otherwise. Upon this becoming known to the Commission a date for further hearing was named; but for some reason the order of notice was so worded that the case was not apparently opened for further consideration on its merits. Various Eastern and Western roads appeared and formally objected to the order as unwarranted in the pending proceedings, while still suggesting that the matter should be further investigated under the greatly changed circumstances of the summer months. The Commission afterwards published a second decision in which the matter was treated as having been opened at the request of the roads, and the original decision was left standing. An order was sent out accordingly, which has since been modified by extending the time for making the reduced rates from Sept. 1 to Oct. 1, and by amending a part of it, which had the effect of favoring St. Louis at the expense of Chicago.

The managers of the roads undoubtedly feel that a transaction of this kind threatens extreme danger to the railroad system. It assumes a power to reduce rates widely upon an important article of traffic. It names six mills per ton per mile as a reasonable charge upon grain from points west of the Missouri River to Chicago, thus destroying the entire net revenue upon this commodity if the returns of the expense of moving freight in that section of country are correctly reported. If this action stands it necessarily follows that all rates may be fixed by the Federal Commission. Meanwhile the government affords no correlative protection to the carriers.

The right of review of an order of this kind in the courts is secured to the roads by the act to regulate commerce, and the purpose of the action taken in Chicago this week is understood to be to secure a judicial construction of the very serious questions which are now presented. Among the other points likely to come before the courts for decision are the following:

1. Has Congress under the constitutional provision giving it power to regulate commerce between the states received authority to fix the prices of the transportation of commodities on railroads whose charters have been granted by the several states in which their lines are situated? 2. If Congress has such authority, can it lawfully be delegated to commissioners? 3. If such delegation is proper, was it so delegated in the act to regulate commerce? In other words, does not the language of that act limit the jurisdiction of the Commission to past transactions, or was it intended to confer authority upon the Commission to establish maximum rates universally? 4. If the Commission has the power to fix rates for Interstate traffic, has it proceeded in accordance with the requirements of the law in the present case? 5. Is the order, in itself, a just and proper order at the present time, and especially in view of the great changes that have recently taken place in the commercial conditions affecting the transportation of grain?

The foregoing are among the questions which are being considered by the counsel of the Western roads, and their presentation to the courts of last resort will be watched with great interest.

Preservation of Timber.

What follows is an abstract of a paper by Mr. H. W. Reed, Roadmaster of the Savannah, Florida & Western, which was read as the report of the Roadmasters' Committee on Preservation of Timber. It was not given by Mr. Reed, nor do we reproduce it here, as containing the results of new or original investigations; but it is an excellent summary of recorded facts.

Pasteur ascribes decay to the action of living germs in the atmosphere. Professor Tyndal sustains the view of Pasteur, and this is the modern and generally accepted theory, and conforms very nearly to the results of modern observation, for it has been determined by repeated experiments that a thorough preservative of timber must not only possess chemical antiseptics for the coagulation of albumen, and power as an insecticide, but must also possess the mechanical property of the exclusion of the atmosphere by filling the pores and surrounding the fibres with a substance impenetrable by the atmosphere.

Having endeavored to accept a reasonable theory as to the cause of decay which will harmonize with the results of years of patient experiment, we will proceed to investigate the remedies. There are four situations which require different properties in the preservatives used. These situations are:

1. Submersion in water, and subject in sea water to attack of the teredo navalis and other sea worms.
2. Exposure to alternate moisture and dryness.
3. Exposure to the atmosphere only.
4. Situated so as to be exposed to transverse strains.

Of the many preservative agents employed those of value may be resolved into two classes, viz.:

1. Those derived from the distillation at high temperature of vegetable tars, albuminous and oily substances.
2. Those having a mineral acid as a base.
3. Any modification or combination of the two foregoing classes.

Under the first head we have creosote as the only known preservative capable of resisting for an indefinite time the attacks of the teredo and destruction of atmospheric germs and of leaving the structure of the timber in its normal condition and strength. Thus creosoting is the only process known that successfully meets *all* the requirements of a wood preservative, only one element, the expense, militating against it.

There is some question relative to the comparative value of coal tar creosote. We have been unable to learn of any experiments with it of sufficient duration to demonstrate its comparative value. But we are of the opinion that by observing the same rules in the use of the products obtained by distillation at high temperature we will arrive at about the same results as in the use of dead oil. If such proves to be the case we can expect to purchase creosote oil at much less than the present rate of one cent per pound.

Under the second head we have the processes of: Kyanizing, treatment with corrosive sublimate; Burnettizing, the use of the chloride of zinc; Boucherie, the use of sulphate of copper.

The patents on these materials as applied to preserving timber have long since expired, thus we are at liberty to use any of them without royalty, provided we do not infringe upon various patented methods of their application.

With the salt at 50 cents per lb., the cost of Kyanizing is estimated at from 25 cents to 32 cents per tie. This process has been recommended for timber entirely protected from moisture (other than atmospheric moisture), but owing to the fact that corrosive sublimate is partially volatile at ordinary temperatures, is readily liquified and is a deadly poison, invariably injuring the workmen engaged in preparing it, and that it is said to render the timber brittle, it is generally considered objectionable as a preservative for ordinary use.

Next in point of age is Burnettizing. Chloride of zinc, when used in large quantities as a solution, over three per cent. strong injures the elasticity and strength of wood seriously. The usual strength is 1.91 to 2 per cent. Another objection is that chloride of zinc is easily soluble in water, and therefore it is manifestly unfit for bridge timber; applied to cross-ties it serves a better purpose, as in that situation it has no transverse strain to resist, and is not readily washed out, but an objection occurs even here, as the ties are liable to crack and split under the rays of the sun.

The cost of this system is from 15 to 25 cents per tie. A report of a committee to the American Society of Civil Engineers, June, 1885, recommends Burnettizing as the best method for preserving cross-ties.

The Boucherie process, with sulphate of copper, has been tried extensively both in this country and in Europe. This process is a failure as against the teredo or other sea worms, and renders the wood very brittle, but as a protection to timber exposed to the atmosphere it seems to have been successful in a few cases and a particular failure in others.

Under the third heading, we will mention a modification of the Burnettizing process, which was patented by Mr. Wellhouse, and has since been extensively employed at several places, notably on the A. T. & S. F. R. R. This process consists, first, of an application of chloride of zinc with a little glue added, followed by a solution of tannin, "which it is claimed forms upon coming in contact with the glue small pellicles or films of insoluble artificial leather, which plug up the mouths of the sap ducts so as to prevent the zinc from washing out." This process has been employed only since 1879, and its merits are yet to be demonstrated.

While we find that creosoting is the most perfect, it is at the same time the most expensive method of timber preservation, and consequently it becomes desirable to form such a combination as will cheapen the process without decreasing the efficiency. This, we believe, may be done for cross-ties by employing sulphate of zinc (Burnettizing), which readily seeks the centre or heart of timber, and does not readily return to the surface again, as the first material to be injected, and next to inject creosote as an outer covering or protection. By this means we obtain a valuable result at minimum cost. The creosote will overcome the tendency of the sulphate of zinc to wash out or volatilize, and will also neutralize the tendency of the timber to surface crack, as when the zinc alone is used, while the zinc will thoroughly protect the interior of the timber. Just how much the cost of creosoting can be reduced by this process only actual experiment can determine. It has been shown that Burnettized timber rots first on the outside, and creosote timber begins to decay on the inside. Thus the combination should be more perfect than either one alone.

Another process known as "Vulcanizing" has been recently introduced, and large claims are made for it. We can not do better than to copy an article from the *Railroad Gazette* on this process. [See the *Railroad Gazette*, Sept. 5, 1890.]

In all works on the subject we find it insisted that open grained or sappy, or thoroughly seasoned timber alone should be used, for the reason that such timber absorbs the preservative solution after the sap is partially removed by seasoning.

Many processes of *applying preservative agents* have been resorted to, from the ordinary paint brush through the various stages of steeping, vital suction and application by hydraulic pressure, to the more perfect means of exhaust and pressure within a closed iron cylinder. This latter method excludes sulphate of copper and corrosive sublimate, which have a deleterious effect on iron. Thus Kyanizing has to be carried on by the steeping process, the timber being placed in vats or tanks, thus rendering this process very tedious. Sulphate of zinc and creosote may be applied in a closed cylinder successfully, and to that method we will refer particularly. [The process is here briefly described.]

Another method of treating timber is by charring it within closed iron cylinders; this process is patented, and is yet on trial. It seems to possess merits of coagulating the albumen rapidly and of placing another exterior barrier against destructive action, as it is well known that charring the outside of timber without the aid of other treatment will materially increase its life. This method, however, is not recommended, as the steaming process seems to possess all the merits of simplicity and efficiency.

In conclusion, while we have not undertaken to state in great detail all of the many points that are essential to the thorough execution of any of the processes noted, we do claim that with the aid of such authorities as S. B. Bolton, Dr. Tindal and T. M. Britton, of England, and the Committee of the American Society of Civil Engineers, headed by Mr. O. Chanute, we have presented a a fair and accurate outline of the subject that will serve as a guide or starting point for future investigation.

Convention of the Master Car and Locomotive Painters' Association.

The twenty-first annual convention of the Master Car and Locomotive Painters' Association of the United States and Canada was held at the American Hotel, Boston, Mass., Sept. 10, 11 and 12, 1890.

The proceedings were opened by Mr. E. L. Fetting, Second Vice-President, in the absence of the President.

Mr. Samuel Brown (Old Colony) announced that his road had put a special train at the disposal of the convention for an excursion to Plymouth. The invitation was accepted, and a vote of thanks tendered to the Old Colony.

The Secretary read his annual report, which was accepted as read. He reported a membership of 125 active and 16 honorary and receipts of $494.37 and expenditures of $266.40.

The following officers were then elected for the ensuing year: *President*, Joseph E. Murphy (Louisville & Nashville); *First Vice-President*, E. L. Fetting (N. Y. & N. E.); *Second Vice-President*, A. S. Coleman (Intercolonial); *Secretary and Treasurer*, Robert McKeon (N. Y. & P.), Kent, O. (re-elected).

In the afternoon session the first business was the discussion of the question, "Is it a benefit or a detriment to an undercoat of paint to have an egg-shell gloss?"

Mr. J. K. LOWREY: I object to working oil in. I do not do it except just enough to make the paints spread. I use about ¼ oil on an undercoat; I never use egg-shell gloss on undercoats; it would be unnecessary, and have a tendency to make the work crack.

Mr. W. O. QUEST: I do not think there would be any detriment if you did not go further than egg-shell gloss.

Mr. JOSEPH MURPHY thought the only object in using it would be that the more oil in the undercoats the more brilliant and solid the varnish would be on top of it; and Mr. J. A. Workman agreed with him.

Mr. HIBBARD believed in priming almost exclusively with oil, and after sand-papering down, putting on the second coat containing considerable oil, but not enough to make an egg-shell gloss; and in every succeeding coat he put in less oil, and in the coloring added but very little.

Mr. WEILAND never allowed a particle of turpentine in his priming, and if it was mixed in oil he found it tenacious, prevented rusting and would not crack. Mr. Lowrey coincided with Mr. Weiland's views. Plenty of oil gave a good foundation, and if there was a surplus of oil it could be rubbed off with rags.

Mr. GOGEN: We all know that the practice of using oil is the most efficient and will wear the longest; but our railroad companies will not allow us 30 or 60 or 90 days to paint a car, but would rather have them done in 10 days if they could; so the proper way for us to do is to paint them a way that would be the most durable in the least time. The best practice is to use a great deal of oil in the first coat. I use almost clear oil in the priming and then drop the oil altogether except in lead. I believe that all who have tried painting cars quickly have found that there is a great tendency to crack when you use oil in connection with japan colors.

Mr. QUEST claimed that the undercoats should be as near homogeneous in their character and nature as possible, with enough body to stand the hard usage incident to railroad work. It should have binding qualities to assure firm, hard drying in the undercoats.

Mr. BIGELOW obtains the best results from putting a certain amount of oil into the primer, according to the softness of the wood; but used no oil after the primer. He believes in having a flat coat for the last one, as being more durable and as retaining a standard color.

Mr. MCKEON: I have our colors dry flat from the priming up. We all know that the wood will absorb seven-tenths, or nine-tenths I should say, of the oil; that is the way I make my priming. I want to have every coat from the time the car is ready to strike off to dry flat,

but not so flat as I have seen it in some places, where you could take the sponge and wash the color off. I use perhaps as good color as you find in the country, but I add one pound of oil to every pound of color, and that brings it into good shape—that is raw oil; no boiled oil in the shop whatever. I find it gives good satisfaction, and you can come down on the Baltimore & Ohio and examine the cars, and if you find any cracks on any cars that have gone through our shops I wish you would call attention to it. The varnish does not crack. I use no rubbing varnish on the work. I use finishing varnish altogether over the flat color.

Mr. LAWTON: We do not allow our work to be out more than two years. To be out indefinitely it would, no doubt, wear out and crack. I never had any varnish crack.

Mr. QUEST: I would like to ask the gentleman here how varnish can crack if the foundation is perfectly solid. If that foundation was solid, how could it be the cause of the varnish cracking? I would like to get a little information on the question.

Mr. LAWTON: It comes from the effect of your putting on your finish with too much oil. The varnish dries faster than your oil does, and the consequence is that it cracks like a turtle's back.

The next subject discussed was, "What is the best way to test the quality of japan before mixing into paint?"

Mr. GORDEN: When I get an invoice of japan which I have not been using, I make a simple test. If it mixes thoroughly with the oil, and does not spread, and dries well, I generally take a piece of glass and put some oil on it, and japan on, and mix it up thoroughly, and if it does not spread, and dries that oil thoroughly, then I take it for granted it is a good japan drier; but if it curdles, then I have no use for it.

Mr. LAWTON: That would hardly test the drying quality; there is more drying quality in some japans than others.

Mr. FETTING: I have another method to find out the elasticity of japan. I test it on tin. I coat it over tin, and to dry it and hasten results I put it in the oven that I heat all brass work in, and raise the temperature to a certain degree. This is merely to get certain results, and then from the tin find the elasticity.

The Secretary then read the following tests: "Test 1. Mix a portion of the japan on trial with linseed oil. If it curdles the oil, mark it down as poor stuff. Test 2. Mix the japan with oil paint in usual proportions to make the paint dry well, and coat up a piece of work which has been primed (at least). If the paint dries tacky, pronounce the japan bad. Test 3. Grind drop black (stiff) in Japan. Thin with turps to the usual consistency for working, and spread on a coat. If after standing twelve hours in a warm shop it warps up, set it down as deficient in binding properties. Test 4. Spread a coat of the same evenly upon a clean glass; let the coat dry 48 hours, and look through it at the strong sunlight or at a single lamp burning in a dark room (the latter is the best). If you find the paint full of fine cracks use no more of that japan. The last is a severe test, but first-class japan will pass under it. For quick drying properties test with lamp black ground in raw oil; if it dries this it will dry almost anything else.

The next question under discussion was "Should hard and soft woods be primed or treated alike to make a good and lasting job of painting?"

Mr. W. J. ORR stated that he treated the hard and soft wood alike, and did not put much oil on either.

Mr. THOMAS BURKE thought less oil should be used on hard wood than on soft, as the latter absorbs more oil.

Mr. LAWTON: I think it would do no harm to put the oil on, but rub it off. If it strikes in it will do no harm, but it will not be left on the soft wood as it would on the hard wood.

Mr. HIBBARD: While I do not usually use as much oil in hard wood as soft wood, yet at the same time, if a person has time, I do not see any disadvantage. If it dries a little glossy, let it dry and sand-paper it off.

Mr. SAMUEL BROWN: It is not right to treat hard wood the same as you would soft. I endeavor to bring to the minds of my boys to be a little more stingy when they get to the hard wood than they would be on the soft.

Mr. WEBB: In priming hard wood there is two-thirds of the wood where it will strike in as much in the hard wood as in soft wood; for that reason I generally prime the hard wood with the same as the soft wood.

It has been my experience that the posts have usually cracked more than any other part of the car; and I always use a little turpentine in priming for the posts, and do not have so much oil in it.

Mr. BAILEY: I prime the whole car with the same batch of priming; the panels do not crack first, and the iron work does not crack at all. I use raw oil, and give it plenty of time—generally two weeks.

The next subject considered was, "What is the best one coat of paint that will hold rust back the longest?"

Mr. GOHEN: The best coat of paint that I ever saw to keep back rust was the paint they brand their iron with when they make it, and I believe it is because it was put on hot. I never saw a tank that was rusted but you could find the brand as clear as when new. I saw a tank last week standing outside the shop; they had burned it off because of the rust, and on that tank there was a garment of rust, except where the brand was put on. Now, if you can tell me with what material that was put on, that is the best paint to be used.

Mr. BROWN: Here is a question that is worth a great deal to all of us. We had a short time ago a very serious accident on our road, and the tank that was in that scrap now lies out on the road, and if you saw the rust inside of that tank you would be surprised. The master mechanic asked me if I knew any paint that would prevent a tank rusting on the inside; and he said, if you do, it will be of immense benefit.

Mr. LAWTON: I would express my opinion for red lead, oil and japan mixed. For one-coat work this would last longer than any other preparation I know of, and would keep the rust off.

Mr. WILL: You will all have to come to oil, I can tell you. You can use varnish and japan as much as you want to, but you will have to come to oil.

Mr. GEAR: Mr. President, I tried red lead, and I should say that I had no better results in the use of red lead than with white; but I think I had a little better result in using Prince's metallic, dark shade; and I think Prince's metallic and raw oil, mixed up to a certain consistency, and brushed over that work, will hold back rust longer than red lead, or keg lead either.

Mr. GEAR: I would not have any hesitation in saying that oil and Prince's metallic is most decidedly the best thing that can be used. That is demonstrated right along in bridge work. I do not know of any paint alone that will stand on the inside of a tank, for the simple reason that there is corrosion from all sorts of substances in the tank.

Mr. MCKEON: Some years ago I primed a tank with a very dark lead color, using lamp black, lead, raw oil, and a little dryer. I found that was the best thing to keep back rust I ever tried, and, of course, if one coat of paint will not do it, a dozen coats will not do it. I believe if your iron is hot the more it will harden in the iron and protect it from rusting.

MR. ATWATER: If there is only one coat to be put on, oil and Prince's metallic will hold its own as long as anything I know of. If you are going to coat over that on the surface of a tank you have got to use something besides raw oil, but on the inside of the tank I do not know of anything that will prevent rusting.

The next subject was, "Which color will show up the best on a locomotive and tank after eight or ten months of service, ivory black, lamp black, or Brunswick green?"

Mr. HIBBARD and Mr. Lowrey both expressed themselves as being in favor of ivory black.

Mr. FETTING: I never used lamp black, because I never liked the looks of it, but the plain drop black and green. I paint my engines with Brunswick green. I find no difference in wearing between ivory black and Brunswick green, except that the latter is much easier to touch up after two or three years' wear. I should say the average life of our engines is about four years. I would say that I use lead for the outside tank, and for the inside and reservoir I use plumbago, and I find that the best we have ever had. We also use it on smoke stacks and boiler butts, and we find nothing better than plumbago, if used with caution.

The next question was, "What is the best and quickest method of removing old, cracked and scaly paint from engine driving wheels, domes and other rough castings?"

Mr. GOHEN: We have a four-foot tank, and we have a steam pipe running from the boiler to that, and we put lye and soda in that, and drop all the castings in that we want to get the paint off from, and we take the springs and driving box and get the grease off of them. We put them in there and turn the steam on, and pull them right out. When we take the driving wheels off, we do them the same as we do our tank. We use crystallized soda and soft soap, and that takes it off readily.

The Secretary read the following report from Mr. Horton, of Elkhart, Ind., on this subject:

Steam wheels, each, 25 minutes; cleaning wheels, each, 30 minutes. After the first wheel has been steamed and while the second wheel is steaming, scrape the first one and after so doing wash off (while hot) with strong soft soap. Continue in this way until all the wheels desired are cleaned. Other rough castings treated as above. Four helpers are used on this class of work in my department. I have used the apparatus since August, 1887, in these shops, and find it a complete success.

The Secretary read the following from Mr. Quest:

We mix and place in a barrel a liquid compound composed of 30 lbs. boxed lye, 30 lbs. sal soda, 3 quarts of ammonia. The lye and soda we dissolve separately each in 3 gallons of water. When thoroughly dissolved, put both in the barrel and allow them to cool, then add the ammonia with 15 additional gallons of water. We take 30 lbs. common unslaked ground lime to about 5 gallons of liquid, 3 of which is heated when slaking lime. Then add the balance with 3 or 4 lbs. common melted laundry soap (cold). The caustic mixture when ready for use should be about the consistency of a heavy knifing or glazing putty that can be applied on a flat surface to a thickness of ⅛ of an inch with a broad scraping-in knife or small trowel, but a 4-in. flat Tempico brush answers the purpose much better for all classes of this work, requiring less skill to apply the material. One man could repeat the coats almost continuously until the necessary thickness was attained, which never failed in doing the work in a thorough manner in five to six hours after application. The castings of the heated parts we found some trouble with at first on account of the brittle nature of the old paint. We use the soap to prevent the lime from drying, which it will do without something of this nature.

Mr. ALEXANDER CAMPBELL: I have been using that lime and soda for some time for removing paint from tanks, but I found some trouble in its drying. The soap, I think, will be a benefit in keeping the lime from drying up.

Mr. Quest stated that it cost about $2.50 to make one tank ready for a coat of primer according to the method he used.

Mr. Fetting stated that he had been obliged to discard the mothod of using lye, soda, lime and oil some eight or nine years ago, as he could not succeed in freeing the tank from the alkalies. Now he employs three men who would scrape a 3,600-gallon tank in a day, and that cost him $3.50.

TECHNICAL.

Manufacturing and Business.

The New York Belting & Packing Co. has completed the order for belting for the New York Central grain elevator at New York. The order included an aggregate of 71 belts, all rubber and of the company's manufacture, among which were 19 elevator five-ply bucket belts, each 313 ft. long and 22 in. wide. The main driving belt is 350 ft. long, 52 in. wide and eight-ply thick.

The A. & W. S. Carr Co., of 138 Centre street, New York, manufacturers of valves and gates for steam, water and gas, have put on a double shift of men at the factories in Paterson.

The Odell Automatic Switch Co. has been chartered in New York to manufacture the Odell automatic railroad switch and other track appliances. The trustees are: Albert P. Odell, John K. Chapman, Jason D. Case, John W. Kales, Jesse C. Bowen, James X. Williams, Alfred Spring, Alonzo T. Wilcox and Frank H. Hicks. The principal office is to be at Franklinville, N. Y. The capital stock is to be $100,000.

A certificate of incorporation has been filed in New York by the Buffalo Railway Supply Co. for the purpose of manufacturing Cumming's railroad patent crossing and switch frog and other railroad supplies. The capital stock is $100,000, and Thomas J. Riggs, James Cumming, John J. Kennedy, Richard R. Ditzel, John J. Griffin, William P. Burns and Jonathan L. Slater, of Buffalo, are the trustees. The principal office is to be at Buffalo.

The Automatic Railway Gate and Signal Co. has been incorporated in New Jersey with a capital stock of $1,000,000 by H. S. Montgomery, of Elizabethport, and W. L. Van Dewenter and Charles A. Crestadon, of Elizabeth.

The Bonzano Metallic Railroad Tie Co. has been chartered in New Jersey, with a capital of $1,000,000, to manufacture steel railroad ties under the patents of M. F. Bonzano, Assistant General Superintendent of the Philadelphia & Reading.

The Berlin Iron Bridge Co., of East Berlin, Conn., has the contract for building a machine shop and foundry for the Lake Erie Engineering Co., Buffalo, N. Y. The buildings are of iron and 180 × 185 and 180 × 225 ft., respectively. They are to be completed Jan. 1.

The Midvale Steel Co., of Philadelphia, is to erect a new casting shop 135 × 285 ft. There are two wings, each 50 ft. long, and in the main building there will be a 50-ton traveling crane. The building is to be constructed entirely of iron by the Berlin Iron Bridge Co.

The Berlin Iron Bridge Co., is to erect two iron buildings for the Manufacturing Investment Co., of Madison, Me. One is four stories high, 62 × 220 ft., and the other 72 × 172 ft. There is also a washing room 72 × 182 ft.

The Secretary of State of South Carolina has granted a charter to the Lockhart Shoals Construction Co., 50 per cent. ($7,500) of the capital stock having been subscribed and 20 per cent. of the amount subscribed paid in. Wade Osborne is manager. The directors are: Wade Osborne, R. C. Thomson and J. M. Sims.

Messrs. McNeil & McLachlan, Franklin Steam Boiler Works (Greenpoint), Brooklyn, N. Y., are constructing a sheet-steel water trough for the New York Central & Hudson River Railroad. It will be delivered in 60 ft. sections. The total weight is over 75 tons.

The Northwestern Equipment Co., of Chicago, has been incorporated in Illinois to manufacture railroad supplies, construct railroads and for the negotiation of car trusts; capital stock, $500,000; incorporators, Mahlon S. Frost, Sidney A. Stevens, Edward I. Frost.

The Westinghouse Machine Co. made sales during August of 87 engines with an aggregate horse power of 4,640. Foreign orders during the month included France, Germany, Australia, Bavaria, Mexico, Spain, Cuba and Nova Scotia.

The Gillette Electric Gate Co., of Chicago, has been organized to manufacture electric gates for drawbridges, railroad crossings, etc. The capital is $1,000,000, and the incorporators are: Harleigh Gillette, Ernest L. Prussing, Benjamin Stickney, Robert H. Gillette.

W. W. Keys, of the Deoxidized Metal Co., of Bridgeport, Conn., has received a patent for a new process of deoxidizing copper, which process the company is now using on all sulphate work. This company has just added another new building to its works for its babbitt and white metal business and an addition to the loom casting department will soon be made.

Iron and Steel.

The Atkinson Car Spring Works, of Chicago, has been changed to the Atkinson Steel Spring Works. The principal object of the change in the name is to inform the public of the fact that the firm manufactures high grades of steel as well as springs. The plant is being remodeled, and when fully completed it will be a most compact, economical and complete spring manufactory. It will probably be in full operation by Oct. 1.

The Northern furnace at Chocolay, near Marquette, Mich., will probably be ready for operating this month. The furnace has lain idle for 17 years. It will turn out about 50 tons of pig iron a day.

The Ashland Steel Co., of Ashland, Ky., with a capital of $1,000,000, is to build a plant with a capacity of 300 tons per day of finished steel. The directors of the company are: Ironton A. Kelly, President; Lindsay Kelly, B. H. Burr, Secretary, and L. T. Dean, of Ironton, O.; John Russell, Vice-President, and E. C. Means, Treasurer, of Ashland, Ky.; Gazzam Gano, of Cincinnati, O.; John G. Peebles, of Portsmouth, O., and W. P. Franklin, of Columbus, O.

The Dominion Iron & Steel Co. has been incorporated at St. John, N. B., with a capital stock of $500,000. The company is formed for the purpose of erecting mills near St. John for the manufacture of rolled and hammered iron, bar iron, railroad spikes, fish plates, and other articles. The building will contain four train rolls, 10 furnaces, nail and spike factory with 50 machines, general machine shop and shafting department.

The Washburn & Moen Mfg Co., of Worcester, Mass., has increased its capital stock from $1,500,000 to $2,000,000 by the issue of 5,000 shares.

New Stations, Shops, etc.

The order for the machinery and other equipment for the new shops of the West Virginia Central road, to be located at Elkins, W. Va., has been placed, and the work of building the shops has commenced.

The Madison Car Co. has lately been organized at St. Louis, Mo., to erect car shops at Madison, Ill., a new town near the east end of the Merchants' bridge across the Mississippi. A tract of 30 acres has been purchased and the company expects to erect shops with a capacity of 20 cars per day. The capital stock of the company will be $400,000, and among the principal stockholders are T. C. Salveter, late General Manager of the St. Charles Car Co., Charles McClure, L. M. Rumsey, August Gehner, Charles F. Orthwein and Joseph Pulsifer.

The Richmond & Danville is to build shops at Charlotte, N. C. The ground for the site has been purchased, and work on the main building will commence at once.

The Boston & Albany is erecting a stone passenger station at Rice's Crossing, 12 miles from Boston.

A passenger depot will be built by the Great Northern at Grand Forks, S. D., to cost $20,000.

The Hartford Steel Tie.

At the Roadmasters' Convention the A. J. Hartford Steel Railway Tie Manufacturing Co. showed a model of a new design of steel tie, or, more properly, a modification of the well-known Hartford tie. It will be remembered that, as heretofore made, this tie has a narrow channel on the centre line throughout the length of the tie. This channel was simply made to provide a seat for the adjustable clips which hold the rail. Of course the space occupied by these clips is but a very small part of the length of the tie, but it was cheaper to roll the tie in this shape, with the channel extending its entire length, than to make only a seat for the clips. In the new model the clips rest on the upper surface of the tie, and the channel is entirely dispensed with, adding, undoubtedly,

to the strength and durability. The tie is also curved downward toward the middle with a view of getting a better hold in the ballast.

Screw Ferry Boats.

The Pennsylvania Railroad is building a ferry boat for use at New York to be propelled by a screw at each end, somewhat similiar in design to the Delaware, Lackawanna & Western ferry boat "Bergen," which was described in these columns Aug. 9, 1889. The new Pennsylvania boat will have two decks as will the "Brunswick," which is now rebuilding, and as will probably all the boats to be built by that company hereafter. As the trains will enter the Jersey City station at a high level as soon as the work of the viaduct and new station at that place is completed, and as the passengers will cross West street (on the New York side) on a bridge, there will be a convenience in the use of the double deck boat.

Chignecto Marine Railway.

We gave Sept. 12 an account of the present condition of the work on this enterprise. By later information we learn that some of the casings for the rams were set in the Amherst Dock Sept. 11, and that Hon. C. H. Tupper, Minister of Marine, set the corner-stone of the Tidnish Dock Sept. 12; Mrs. H. G. C. Ketchum, wife of the Chief Engineer, set the corner-stone of the Amherst Dock Sept 3.

Interlocking.

The New York, Lake Erie & Western has contracted with the Johnson Railroad Signal Co., of Rahway, N. J., to equip its Jersey City yard with interlocking switches and signals. Three towers will be built.

The Norwood Car Replacer.

A test of this replacer was made on the tracks of the New York, Pennsylvania & Ohio at Cleveland last week. A loaded gondola was first run off, and the replacers put in position and upon signal being given to the engineer the car rolled back to the track as easily as though it had never been off. The car was then run up to a curve and backed off, so that the wheels stood about 18 in. from the track. The extension or guide rail was then laid down, and the wheels were guided up to the replacers and then on to the tracks without any unusual strain to the engine. The car was tnen uncoupled and the replacers put in position, and an effort made to derail the engine by blocking up between the wheel and replacer; but while the obstruction would cause the wheel to carry over the rail, as soon as it reached the replacer it would be brought into place, so that all attempts to derail were unsuccessful. The engine, weighing 53 tons, was finally run off at a misplaced switch. The replacers were then set in position, and the engine was restored to its track in 12 minutes. The replacers are but 2 ft. long, made of cast steel or malleable iron, and weigh, complete, 170 lbs. They are reversible, and can be used to replace cars from either direction or either side of the rail. A feature is the extension or guide rail, which is an ordinary piece of track rail, adjusted to the end of the inside frog, and carried obliquely across the ties to the opposite rail. This device is manufactured by the Norwood Car Replacer Co., Baltimore.

Denver & Rio Grande Standard Gauge Equipment.

All of the standard gauge equipment ordered will be ready by the last of this month, and some of it is now on its way. The contracts are let to the following firms: Baldwin Locomotive Works, for the locomotives; the Peninsular Car Co. of Detroit for the freight cars, and the Pullman Palace Car Co. for the passenger coaches. The estimated cost of the entire lot is $1,384,159. The following is a list of it: 200 coal cars, two Shaffer snow plows, one business car, seven switch engines, 13 ten-wheel passenger engines, 28 consolidation freight engines, 19 first-class passenger coaches, 10 second-class passenger coaches, nine combination baggage and express cars, four mail and express cars, 23 cabooses, one wrecking-derrick car, one wrecking tool car, five combination mail and express cars (changed from narrow gauge), one steam excavator, 13 construction cars, three low flat cars with cook house, 100 low flat cars, 100 box cars, 200 low flat cars and 100 stock cars. The company has also just ordered 16 narrow gauge dump cars.

Standards for the M. C. B. Coupler.

At the last convention of the Master Car Builders' Association it was suggested that a special committee be appointed to ascertain if the various automatic couplers of the M. C. B. type being manufactured and sold conform to the standards of the Association, and the Executive Committee was instructed to take hold of the subject and investigate it. Accordingly, a sub-committee of the Executive Committee was appointed by the President, consisting of Messrs. E. Chamberlain, J. N. Barr, and E. W. Grieves, to carry out the details of the investigation and make their recommendations as to the use of templets, and general instructions in the matter of conformity. This committee has addressed the following letter to the manufacturers of the various couplers:

"The special committee appointed from the M. C. B. Association to ascertain whether the M. C. B. type of coupler now being furnished by the several manufacturers conforms to the standards of the Association, and to submit a plan for the guidance of the Association in the maintenance of these standards, would respectfully request that manufacturers of this type of coupler forward, on or before Nov. 1, 1890, at their own expense, freight or express charges prepaid, to Buffalo, N. Y., care of E. Chamberlain, Chairman of Committee, a sample coupler and drawing, or blue print of the same, for examination by the committee. All sample couplers and drawings will be returned to the owners immediately upon completion of the committee's work.

A Tunnel from Staten Island to Long Island.

A bill was introduced in the House of Representatives at Washington, Sept. 15, by Mr. Covert, of New York, to authorize the construction of a tunnel under New York Bay between Staten Island and Bay Ridge. The bill gives to the New Jersey & Staten Island Junction Co. the right to build and maintain the tunnel, and to lay railroad tracks within it. The work upon it must begin within three years after the passage of the bill. The railroad which seeks authority to build the tunnel was incorporated three years ago, and Mr. Erastus Wiman is President of it. The route laid out will connect the Arthur Kill bridge with the warehouses on the Brooklyn front and with the projected East River tunnel. Carried out to its logical end, it will thus connect all the railroads reaching New York from the West with those coming in from the North and East, and with the Long Island Railroad, and hence, of ccurse, with Montauk and the short Atlantic route to England. C'est magnifique, mais . . . .

One of the North River Bridges.

A regular meeting of the New York and New Jersey Bridge Commission was held Sept. 16 in New York. The entire Commission was present, as follows: Andrew H. Green, Frank K. Hain, Charles M. Vail, Evan Thomas, Isador Straus. In addition to the Commissioners were present Thomas C. Clarke, Chief Engineer, Charles B. Brush, Assistant Engineer. A report read showed that $300,000 of the capital stock had been subscribed and $10 per share paid in.

It was determined to call a meeting of the stockholders for Wednesday, Oct. 1, to be held at No. 214 Broadway, to elect officers and directors, and to consider other important business.

An Odometer Car.

At the Detroit Convention of the Roadmasters' Association a Sheffield velocipede car was exhibited by Fairbanks, Morse & Co., with an odometer attachment for recording the distances run. The registering apparatus is connected by link belt to the forward wheel of the car. This wheel has a carefully turned, cylindrical tread of known circumference, and by counters the number of revolutions is registered in feet. The apparatus is designed to register up to 20 miles. Undoubtedly it will be of convenience to officers and section men in many cases.

THE SCRAP HEAP.

Notes.

There has been a small strike of yard brakemen on the Union Pacific at Denver, Colo.

The strikers on the St. Louis, Arkansas & Texas surrendered Sept. 8. Two of them were subsequently arrested by the United States Marshal.

Jerome A. Brown, a conductor on the Boston & Maine, has been sentenced to a year's imprisonment for embezzlement of railroad tickets.

The Brotherhood of Locomotive Firemen, at their annual meeting in San Francisco, Sept. 12, took action looking to the construction of a $150,000 building in some central city.

Five engineers on the Cleveland, Cincinnati, Chicago & St. Louis received $225 each as their pay for the month of August. The rate of wages has lately been increased to make it uniform over the whole of the Big Four systems.

The Pittsburgh, Cincinnati & St. Louis Railroad has awarded the contract for opening tunnel No. 10, near Bowerston, O., to permit the laying of a second track, to James P. Ritson. The work will not be finished until the spring.

President Depew of the New York Central arrived home from Europe last week and was at once called upon by a committee of the strikers. He told them: "The places of those men have now been filled, and that's the end of it. There is no use in making false promises to you. There is nothing more to be done. I do not care to talk over back numbers. You have chosen to resign your places. Mr. Webb has filled them, and I have nothing more to say."

Five former employés of the New York Central, all Knights of Labor, are under arrest at Troy; two of them were, it is said, captured in Canada. No definite evidence of complicity by these men in the train wrecking has been published. Dunwoody, the flagman who stopped a train for an obstruction near New Hamburg, Sept. 8, and whose story of an attempt to wreck the train was doubted, has been suspended; but no further information has been published.

The Floods of the Week.

The reports of disastrous floods in New York state and Pennsylvania on Wednesday of last week were followed by others causing still greater damage, and some of the worst effects of the protracted rainstorm were reported on the 13th. Land slides and washouts, doing a great deal of damage and seriously delaying trains, were too numerous to mention along the Erie, Northern Central and Fall Brook coal companies' roads. At Emporium, Pa., the Philadelphia & Erie had a temporary bridge carried away. The Delaware, Lackawanna & Western lost a bridge near Bath. The Cleveland & Marietta had a land slide and the Cleveland, Akron & Wheeling lost a bridge near New Philadelphia, O. The floods were general over Northern Ohio on the 12th. The Cleveland, Akron & Columbus and the Chicago, St. Louis & Pittsburgh both had extensive washouts. At New Castle, Pa., a bridge of the Pennsylvania Company, which had been weighted with loaded cars, was carried away with the loaded cars. Near Watertown, N. Y., several highway bridges were washed away. The Carthage & Adriondack Railroad had a number of washouts. A number of washouts on the Rome, Watertown & Ogdensburg were reported from Oswego.

About 100 ft. of the iron trestle approach to the new bridge at Eagle Pass, Tex., was washed away on the 12th.

A Big Suit Compromised.

The suit of Logan, Emery & Weaver against the Pennsylvania for alleged overcharges on shipments of oil extending over a considerable period and aggregating $317,000 has been compromised. It has been in the courts three years. Each side claims to have secured about all that it wanted, but the exact sum paid in settlement is not published. President Roberts and Controller Downing of the road were compelled to go to Smethport, Pa., to testify.

LOCOMOTIVE BUILDING.

The Canadian Locomotive & Engine Co., of Kingston, Ont., has completed several locomotives for the Great Falls & Canada road.

The South Bound road has ordered two locomotives of the Baldwin Locomotive Works.

The Cape Fear & Yadkin Valley has just received two new 50-ton ten-wheel freight locomotives. Several other engines are being built for the road.

Three new ten-wheel engines have been received by the Western of Alabama. They have 18 × 24 in. cylinders.

H. K. Porter & Co., of Pittsburgh, have received orders for several light locomotives to go to silver mines in Chihuahua, Sonora and Durango, Mexico.

The New York, Pennsylvania & Ohio has just received five ten-wheel engines from the Baldwin Locomotive Works.

Fifteen locomotives are reported to have been ordered for the Western & Atlantic, to be delivered when the new lessees take possession.

CAR BUILDING.

E. D. Smith & Co., of Philadelphia, will soon award the contracts for building 500 coal cars for the Western New York & Pennsylvania.

The Cleveland, Akron & Columbus has awarded the contract for 500 cars to the Ensign Car Mfg. Co., of Huntington, W. Va., for 250 to the Lafayette Car Co., and for a similar number to the Missouri Car & Foundry Co.

The Iron Car Co. is asking bids on 2,400 cars which will soon be contracted for with outside firms.

The South Baltimore Car Co. is building five freight cars for the Cape Fear & Yadkin Valley road.

A. C. McEwen, 79 Morgan street, Jersey City, has an order for eight freight cars for export for use on sugar plantations.

The Wheeling Bridge & Terminal Co. is in the market for 50 platform cars.

The Delaware, Lackawanna & Western Live Stock Co. is asking bids on 150 freight cars.

The United States Rolling Stock Co. has received at its Anniston (Ala.) shops orders for 300 freight cars for the Savannah, Americus & Montgomery; 300 coal cars for the East Tennessee, Virginia & Georgia, and 200 platform cars for the Montgomery, Tuscaloosa & Memphis.

The Ensign Car Works, at Huntington, W. Va., have an order for 100 cars for the Chesapeake & Ohio.

Plans are now being prepared for the new car shops which are to be built in Kansas City by the Chase Refrigerator Car Co. and the Kansas City Packing Co. The works will consist of two large brick buildings and a number of small ones. One large building will be used for a carpenter department for manufacturing the frame work. The other building will be occupied by the machine shops and foundry. An extra building will be built for the painting department and engine room. In addition to this seven acres more of land will be used for yards and tracks. The company will manufacture refrigerator cars exclusively, and will employ about 200 men.

The Western & Atlantic is said to be placing orders for 1,000 freight cars.

BRIDGE BUILDING.

Carrollton, Ky.—A bill has been introduced into Congress authorizing the Louisville, Covington & Cincinnati, Carrollton & Louisville and Westport, Carrollton & Covington roads to build a bridge across the Kentucky River at this place.

Doddridge County, W. Va.—The County Court will on Sept. 22 let the contract for building three of the new steel bridges over various streams in the county which were authorized early in August, as mentioned in these columns Aug. 8.

East Texas, Pa.—The County Commissioners will soon ask for bids for an iron bridge over the Little Lehigh River.

Ferndale, Wash.—The Detroit Bridge Co. has the contract for the iron work on the drawbridge of the Fairhaven & Southern, to be built across the Nooksack River at Ferndale.

Jefferson County, O.—The County Commissioners have awarded the contract for the steel work on eleven new county road bridges to the Massillon (O.) Bridge Co. at $10.25 per lineal foot. There were twelve bidders.

Kanawha County, W. Va.—The County Court last week awarded the contract for a new steel bridge over Two and Three-Quarter Mile Creek to the Wrought Iron Bridge Co., of Canton, O., for $27,000.

Middlesborough, Ky.—Bids will be received by D. N. Mason until Oct. 1 for the construction of an iron bridge 100 ft. wide, 60 ft. long, 60 ft. roadway, and with two 20-ft. sidewalks, over Yellow Creek Canal.

New Albany, Ind.—The County Commissioners have let the contract for the new bridge over Falling Run Creek at Pearl street, in New Albany, to Edward Crumbo.

Pickens C. H., S. C.—G. H. Crafts & Co., of Atlanta, Ga., have received the contract for rebuilding the bridge across the Keowee River at this place for $4,070.

Reading, Pa.—Bids will be received by W. H. Fisher, Court House, Reading, for the masonry abutments and wing walls for an iron truss bridge over Swatara Creek.

Rockwood, Tenn.—It is stated that the East Tennessee, Virginia & Georgia and the Chattanooga Land, Coal, Iron & Railway Co. have completed arrangements for the construction of a bridge to cost $300,000.

St. Paul, Minn.—The city clerk has been authorized to advertise for bids for the bridge across the right of way of the Wisconsin Central road at Mississippi street.

San Antonio, Tex.—Proposals will be received by the city authorities for the construction of a through truss, class "A," bridge on the San Antonio River.

Three Rivers, Mass.—The New London Northern is preparing to build a new iron bridge over the Chicopee River.

White River Junction, Vt.—The Boston & Maine has taken away the old covered bridge which has been in use nearly 43 years over the Connecticut River at White River Junction, on the Passumpsic division, and will replace it by a new three-span, double-track iron bridge, which is about ready to be placed in position. Two new granite piers, each 10 ft. wide, 44 long and 42 high, are being built. The old one is being taken out, and the granite abutments are being reconstructed. It is expected to have the work completed early in November.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

The Supreme Court of the United States holds that the Mississippi statute providing that "all railroads

carrying passengers in this state, other than street railroads, shall provide equal, but separate, accommodation for the white and colored races, by providing two or more passenger cars for each passenger train, or by dividing the passenger cars by a partition so as to secure separate accommodations," since it operates only on the carriage of passengers from one point to another within the state, is not an interference with interstate commerce.[1]

In Alabama the Supreme Court holds that a stockholder in a railroad company who, at a meeting of the stockholders, votes for the lease of the road to another company cannot, while his company continues to be committed to the lease, attack its validity.[2]

The Supreme Court of Indiana decides that a resolution of the directors of a railroad company that the president's salary "shall be paid monthly out of the money that may come into the hands of the treasurer from the first sale of bonds," being merely an appropriation of a particular fund to the payment of such salary, does not exempt the corporation from liability therefor until the bonds are sold.[3]

In California a deed to a railroad of a right of way "along the line as surveyed and laid out" by the company's engineer is not void for uncertainty where it appears that when the deed was executed the line of the road had been surveyed and distinctly marked by stakes stuck in the ground, and that subsequently the road was constructed following the exact line of the survey.[4]

The New York Supreme Court holds that the law of 1888 forbidding any steam railroad doing business in the state of New York to heat its passenger cars by any stove or furnace kept inside the car, or suspended therefrom, but providing that the act shall not apply to railroads less than 50 miles in length, applies to all railroad companies doing business in the state having 50 miles and upward of road in use, though not all within the state.[5]

In Kansas the Supreme Court rules that where a railroad company is a stockholder only in a connecting railroad it is not liable for the negligence of the connecting railroad.[6]

Carriage of Goods and Injuries to Property.

In Texas the Supreme Court rules that under the state statute, which declares that the duties and liabilities of carriers in Texas shall be the same as at common law, except where otherwise provided, a common carrier is not liable for depreciation in the value of goods resulting solely from inevitable delay in their transportation caused by a mob of rioters.[7]

In Iowa, in an action for the loss of cattle shipped over defendant's road, the jury were instructed that if the train was unable to proceed by reason of a storm and cold, and defendant unloaded the cattle without plaintiffs' consent, and placed them in yards insufficient in strength or size ordinarily to prevent cattle from escaping, and they escaped, without fault or negligence of plaintiffs, and defendant did not exercise reasonable care and prudence, and the stock were lost without negligence of plaintiffs, they should find for plaintiffs; but if the stock were there in charge of one of the plaintiffs, and he placed them in the yards, plaintiffs could not recover; and if defendant was requested to place the cattle next the coal sheds, failure to do so would not, as matter of law, be negligence, but negligence must be determined from all the facts and circumstances in evidence. The Supreme Court affirms the instructions.[8]

In Tennessee the Supreme Court holds that a railroad that has made no reduction in its freight rates in consideration of a stipulation in a bill of lading exempting it from loss by fire; that has furnished its agent with no form for a bill of lading not containing the "fire clause;" and that has given him no authority to submit to the shipper the alternative of paying a higher rate for a shipment with the common-law responsibility attaching to the company—is liable for goods destroyed by fire, though the company's officers testify that the company had a higher freight rate, where the "limited liability" clause was omitted from the bill of lading, and that, if the shipper had so requested, permission would have been given to ship under a contract without the "fire clause" in it. The stipulation, being unreasonable and unjust, is not a valid limitation of the company's common-law liability as a common carrier. And where a railroad has not given its customers the choice of shipping under a bill of lading without the clause exempting it from liability for loss by fire, the acquiescence of the shipping public in the form of the bill of lading containing the "fire clause" does not establish the reasonableness of the exemption.[9]

In the Federal Court it is held that where the title of one claiming under the land laws of the United States is under consideration in the land office, a railroad company will be enjoined from entering upon the land until it has taken proceedings to condemn the land, and has given security for the payment of the appraised damages as soon as complainant's title shall have been determined in the land office.[10]

In Pennsylvania the Supreme Court rules that a railroad is not liable for injuries resulting from the frightening of horses by the noise of its trains, where they are operated in a lawful manner, and without negligence or malice.[11]

Injuries to Passengers, Employees and Strangers.

In Texas the Supreme Court rules that in an action against a carrier for personal injuries, where it appears that a freight train was forbidden to carry passengers, and the conductor so informed plaintiff, and told him he could not carry him, but a brakeman afterwards told him to get on, and he was injured while the train was being made up, it is error to refuse to charge that, if such were the facts, he cannot recover, and that if the train was forbidden to carry passengers the conductor could not relax the rule without the consent of the company.[12]

In Kansas the Supreme Court holds that where two connecting railroad companies use a station jointly, or hire one person to discharge the duties of ticket agent for both, and such person sells a ticket for carriage over one of the roads, the other company is not responsible for the negligence of the road over which the ticket carries the passenger.[13]

In New Jersey the Supreme Court holds that a passenger suing for injuries is not precluded from recovering damages therefor by the fact that she was traveling on Sunday in violation of law.[14]

In West Virginia the Supreme Court rules that a railroad cannot be made responsible for exemplary damages on account of injuries done by one of its servants, even though the act was wanton and malicious, unless the act was expressly or impliedly authorized or ratified by the company.[15]

In a Texas case the evidence showed that plaintiff was employed by defendant to couple cars; that defendant had caused the dirt to be thrown out between the crossties, leaving deep holes; and that the roadmaster had been informed of the danger, but failed to fill up the holes. There was no evidence that plaintiff had any knowledge of the existence of the holes, but it was shown that he could not have seen them while at work. There was a conflict of testimony as to whether it was the duty of plaintiff to remain between the cars in case he failed to effect a coupling at first, or to come out and signal the engineer. The Supreme Court holds the railroad liable.[16]

In Minnesota the plaintiff was employed as a wiper in one of defendant's roundhouses. It was his duty to assist the dispatcher in running the locomotives out of the roundhouse to the main track, and to run them into the house from the main track when surrendered by the regular engineers. Plaintiff was directed by the dispatcher to couple a car to the engine, and went to the car to prepare it for connection. He had had no experience in coupling, and had received no instruction as to signals, but he had observed that it was customary for the engineer to receive signals from the coupler, and had been told by the dispatcher that they dare not move the engine before ringing the bell. The pin in the car which plaintiff was directed to couple was fastened in the draw-head. He stepped to the tender of the locomotive and secured another pin to drive the fastened pin out of the drawhead. The engine was about 10 ft. from the car, and while plaintiff was standing with his back to the engine, engaged in loosening the fastened pin, the engine was moved back by the dispatcher, without any warning, and struck plaintiff. The Supreme Court rules that the railroad is liable.[17]

In Maryland the Court of Appeals rules that a failure to give a signal on approaching a farm crossing is not negligence, though the train, which was running at the rate of 15 miles an hour, was not on schedule time, and though the view of the track was obstructed by a bank until within about 30 yards from the crossing.[18]

In Iowa, the defendant railroad operated two parallel tracks at the place where the accident occurred. Plaintiff testified that at about dusk he and another person in a wagon approached the crossing to the first of these tracks, and stopped twice, but saw no trains approaching. They started across at a slow trot, and discovered a train approaching rapidly from the west, which reached the crossing just as the wagon cleared it—no signals having been given. On reaching the crossing, the engineer whistled, which frightened the team so that it ran towards the crossing of the other track, along which another train was seen rapidly approaching, whose engineer, though seeing plaintiff's danger, increased the speed of the engine, which struck and overturned the wagon. The latter engineer testified that it would have been impossible to stop in time to avoid the accident, and that the endeavored to clear the crossing before plaintiff's term reached it. The evidence was conflicting as to obstructions to the view of the first track from the highway; there being testimony for defendant that a train could have been seen for a distance of 1,300 ft. from the place where plaintiff stopped before crossing. The evidence was also conflicting as to the speed of such train, and as to whether proper signals were given on approaching the crossing The Supreme Court holds the railroad liable.[19]

In Texas the Supreme Court rules that one who voluntarily and unnecessarily halts his team near a railroad track, on which a freight train is standing, with knowledge that they are easily frightened at the noise of trains, cannot recover for personal injuries sustained by reason of the team's becoming unmanageable when the customary signals for starting the train were given.[20]

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1 L., N. O. & T. R. Co. v. State, 10 S. C. Rep., 348.
2 Memphis & C. R. Co. v. Grayson, 7 South. Rep., 122.
3 Indianapolis, E. R. & S. W. R. Co. v. Hyde, 23 N. E. Rep., 706.
4 Thompson v. Southern Cal. M. R. Co., 23 Pac. Rep., 130.
5 People v. N. Y., N. H. & H. R. Co., 8 N. Y. Supp., 672.
6 A., T. & S. F. R. Co. v. Cochran, 23 Pac. Rep., 151.
7 S. C. v. S. F. R. Co., 13 S. W. Rep., 191.
8 Chapin v. C., M. & St. P. R. Co., 44 N. W. Rep., 820.
9 L. & N. R. R. Co. v. Gilbert, 12 S. W. Rep., 1018.
10 Jones v. F. C. & P. R. Co., 41 Fed. Rep., 70
11 Ryan v. Pennsylvania R. Co. (Pa.), 19 Atl. Rep., 81.
12 Gulf, C. & S. F. Ry. Co. v. Campbell, 13 S. W. Rep., 19.
13 Atchison, T. & S. F. R. Co. v. Cochran, 23 Pac. Rep., 151.
14 Delaware, L. & W. R. Co. v. Trautwein, 19 Atl. Rep., 178.
15 Ricketts v. C. & O. R. Co., 10 S. E. Rep., 801.
16 Mo. Pac. R. Co. v. Jones, S. W. Rep., 972.
17 Rehmen v. M. & N. W. R. Co., 44 N. W. Rep., 522.
18 Annapolis & B. S. L. R. Co. v. Pumphrey, 19 Atl. Rep., 8.
19 Peirce v. C., R. I. & P. R. Co., 44 N. W. Rep., 686.
20 Hargis v. St. Louis, A. & T. Ry. Co., 12 S. W. Rep., 953.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Milwaukee, & St. Paul, $3.50 per share on the preferred stock, payable Oct. 22.
Cleveland, Cincinnati, Chicago & St. Louis, quarterly, 1¼ per cent. on the preferred stock, payable Oct. 1.
Connecticut River, quarterly, 2 per cent., payable Oct. 1.
Lehigh Valley, quarterly, 1¼ per cent., payable Oct. 15.
Missouri Pacific, quarterly, 1 per cent., payable Oct. 15.
Pittsburgh, Youngstown & Ashtabula, 3½ per cent. on the preferred stock, and 2½ per cent. on the common stock, payable, in cash, Sept. 25.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Alberta Railway & Coal Co., special, London, Eng., Oct. 15, to ratify the purchase of the Northwestern Coal & Navigation Company's property.
Baltimore & Ohio & Chicago, special, Deshler Block, Columbus, O., Sept. 26.
Boston & Albany, annual, 78 Tremont Street, Boston, Mass., Sept. 24.
Carolina Central, annual, Beach and West streets, New York City, Oct. 9.
Chicago, Detroit & Canada Grand Trunk Junction, annual, room No. 7. Detroit, Grand Haven & Milwaukee depot building, Detroit, Mich., Sept. 24.
Chicago, Milwaukee & St. Paul, annual, Milwaukee, Wis., Sept. 20.
Delaware & North River, special, 10 Wall street, New York City, Sept. 23, to act upon a proposed consolidation with the Port Jervis, Monticello & New York.
Detroit & south Lyon, annual, room 16, Detroit, Grand Haven & Milwaukee depot building, Detroit, Mich., Sept. 24.
Fitchburg, annual, Boston, Mass., Sept. 24.
Illinois Central, annual, Chicago, Ill., Oct. 8.
Knoxville Belt, special, 126 Gay street, Knoxville, Tenn., Nov. 1.
Knoxville, Cumberland Gap & Louisville, special, 126 Gay street, Knoxville, Tenn., Nov. 1.
Knoxville Southern, special, 126 Gay street, Knoxville, Tenn., Nov. 1.
Lake Erie & Western, annual, Bloomington, Ill., Oct. 1.
Louisville & Nashville, annual, Louisville, Ky., Oct. 1.
Louisville, New Orleans & Texas, annual, Memphis, Tenn., Oct. 6.
Michigan Air Line, annual, room No. 7, Detroit, Grand Haven & Milwaukee depot building, Detroit, Mich., Sept. 24.
Ohio & Mississippi, annual, Central Union Depot, Cincinnati, O., Oct. 9.
Old Colony, annual, Boston, Mass., Sept. 30.
Ottawa, Armprior & Renfrew, annual, Ottawa, Ont., Sept. 30.
Port Arthur, Duluth & Western, special, Port Arthur, Ont., Sept. 23.
St. Louis, Alton & Terre Haute, special, Laclede Building, St. Louis, Mo., Oct. 3, to consider the sale to the Cairo, Vincennes & Chicago.
St. Louis Merchants' Bridge Terminal, special, Laclede Building, St Louis, Mo., Oct. 1, to vote upon a proposed increase of the capital stock.
St. Paul & Duluth, annual, St. Paul, Minn., Oct. 9.
West Virginia Central & Pittsburgh, special, Piedmont, W. Va., Sept. 29.

Railroad and Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Railroad Superintendents* will hold its annual meeting in New York City, Oct. 7.

The *General Time Convention* will hold its next semi annual meeting at the Hotel Brunswick in New York City, Oct. 8.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Rookery Building, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, the fourth Wednesday of January, March, May, September and November.

The *Northwest Railroad Club* meets on the first Saturday of each month in the St. Paul Union Station at 7:30 p. m.

The *Northwestern Track and Bridge Association* meets on the Friday following the second Wednesday of each month at 7:30 p. m. in the directors' room of the St. Paul Union station, except in the months of July and August.

The *American Society of Civil Engineers* holds its regular meetings on the first and third Wednesday in each month. at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at the American House, Boston, at 7:30 p. m. on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m , on the first Wednesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the House of the Club, 1,122 Girard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p. m.. at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at 8 p.m. on the third Thursday of each month at the Club rooms, No. 24 West Fourth street, Cincinnati.

The *Civil Engineers' Club of Cleveland* holds regular meetings on the second Tuesday of each month, at 8:00 p. m.. in the Case Library Building, Cleveland. Semi-monthly meetings are held on the fourth Tuesday of the month.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Association of the Southwest* holds regular meetings on the second Thursday evening of each month at 8 o'clock, at the Association headquarters, Nos. 63 and 64 Baxter Court. Nashville, Tenn.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7.30 p. m., on the third Saturday in each month.

The Civil Engineers' Association of Kansas holds regular meetings on the first Wednesday in each month at Wichita, Kan.

An Anual Dinner of the New England Railroad Club.

The New England Railroad Club met Wednesday afternoon, Sept. 10, at Boston, to partake of their annual dinner and to spend the evening socially. There were a number of ladies in attendance. The dinner was presided over by Mr. George Richards, the President of the club. Hon. Harvey N. Shepard and Rev. E. L. Rexford were present as guests.

The committee in charge furnished a very agreeable programme, for in addition to the speeches music was afforded during the evening by the Alpha Banjo, Mandolin and Guitar Club, and Miss Butler, daughter of Mr. L. M. Butler, of the New York, Providence & Boston Railroad, gave a violin solo in a very happy manner. Mr. E. H. Frye gave several dialect recitations, and Mr. C. G. Childs, of the New England Phonograph Co., gave a very entertaining exhibition of a phonograph.

After dinner, Mr. Richards called the gathering to order and announced that the subject for discussion at the October meeting of the club would be "Steel Tired Wheel and Methods of Equalizing the Wear, and Machinery for Turning off the Tires."

After a few words he introduced Hon. Harvey N. Shepard, who spoke of the wonderful safety of travel by rail and then in an address of some length recapitulated some of the facts showing the great progress of the world in material things in recent years.

Mr. J. M. Lauder, Superintendent of Motive Power, Old Colony, was called upon, and said that he was glad to witness so large an attendance, but he thought they

could make their annual gathering more agreeable by reviving their former custom of having a trip down the harbor or a clambake at Providence River. He urged the members to take a greater interest in the monthly meetings of the club, and encourage the officers by their presence and active co-operation. In this way the club would be greatly strengthened.

The Rev. E. L. Rexford, pastor of the First Universalist Church, Boston Highlands, was introduced and spoke at considerable length, developing the idea of the close relationship of all men and all things and of the great work of the railroads in bringing people closer together and making the world better by increasing our sympathy and respect for each other.

Mr. Angus Sinclair also spoke, after which the ladies were invited into a parlor to witness a further exhibition of the phonograph, and the meeting adjourned.

PERSONAL.

—Mr. J. N. Scott, General Superintendent of the Gulf, Colorado & Santa Fe, has tendered his resignation, his wife's ill health making it necessary for him to go with her to a water-cure institution.

—Mr. F. A. Burgess, Superintendent of the Eastern Division of the Atchison, Topeka & Santa Fe, at Topeka, Kan., has resigned. It is said that he is going to the Gulf, Colorado & Santa Fe.

—Mr. T. A. MacKinnon, Manager of Transportation of the Canadian Pacific, of Montreal, has left that place to become the General Manager of the Concord & Montreal, with headquarters at Concord, N. H.

—Gen. C. B. Peck, Vice-President and General Manager of the Atlantic & Danville for the past few years, has resigned that position. Mr. C. R. Capron, General Freight and Passenger Agent, has also resigned.

—Mrs. Gereken, the wife of Mr. H. J. Gerekin, of the A. French Spring Co., who was seriously injured in the wreck of the Montreal express on the New York Central road on Sept. 4, has been removed to her mother's house in Montreal. The doctors do not expect that she will be well enough to leave her room within a month.

—Mr. F. H. Piedmont, late Station Agent of the Richmond & Danville at Goldsboro, N. C., has been appointed Traveling Passenger Agent of the Piedmont Air line, with headquarters at Charlotte, N. C. A local newspaper intends to find out and inform the world whether Mr. Piedmont was named after his road or the road was named after him.

—Mr. E. G. Allen, who has been Superintendent of the Shore Line Division of the New York, New Haven & Hartford for two years past, has resigned to become Superintendent of the Hudson Division of the New York Central. His jurisdiction will extend from New York to Albany, the long Mohawk and Hudson Division having been divided. Mr. Allen was formerly Superintendent of the Eastern Division of the New York & New England.

—Mr. W. W. Finley, Chairman of the Trans-Missouri Freight Association, has been chosen Chairman of the Western Passenger Association, to succeed Mr. J. S. Goddard, who tendered his resignation last week. Mr. Goddard is to accept a better position, probably as Traffic Manager or General Manager, but it is not known definitely to what road he is going. One report says it is the Southern Pacific and another the Southwestern Railway & Steamship Association.

—Mr. George De Haven, Assistant General Passenger Agent of the New York, Lake Erie & Western, has accepted the office of General Passenger Agent of the Chicago & West Michigan, the Detroit, Lansing & Northern and the Saginaw Valley & St. Louis, which have about 700 miles of road, and are operated as one system. Mr. De Haven entered the service of the Pennsylvania as advertising agent in 1880. In 1884 he was transferred to Baltimore, and in 1887 was called to the Erie. His new headquarters will be at Grand Rapids, Mich.

ELECTIONS AND APPOINTMENTS.

Chicago & Erie.—J. C. Moorhead has been appointed Superintendent of Transportation, with headquarters at Cleveland, O. He will report to the General Superintendent and maintain a general supervision over the movement of cars and the train service. He will keep the accounts with foreign roads for equipment, and will perform such other duties as may be assigned to him by the General Superintendent, and will, in his absence, act for him. All reports and communications heretofore addressed to the Car Accountant will hereafter be made to the Superintendent of Transportation.

The following appointments have also been made: A. Mordecai, General Roadmaster; J. H. Dynes, General Land and Tax Agent; Wm. E. Talcott, Special Claim Agent, all with headquarters at Cleveland, O.

Chicago & West Michigan.—George De Haven has been appointed General Passenger and Ticket Agent of this system, with office at Grand Rapids, Mich. William A. Gavett, now Acting General Passenger and Ticket Agent, has been assigned to other duties. Both changes to take effect Oct. 1.

Cincinnati & Ohio River.—A meeting of the stockholders of the company was held at Lawrenceburg, Ind., recently, and the following directors and officers were elected: E. F. Osborn, Joseph Ramey, Jr., W. M. Greene and J. C. Davie, all of Cincinnati, and J. K. Thompson, of Lawrenceburg. E. F. Osborn was elected President and J. C. Davie Secretary and Treasurer.

Cleveland, Akron & Columbus.—The principal offices of the road were changed to Columbus Sept. 15. On and after that date Columbus will be the proper address of the President and General Manager, Secretary, Treasurer, Auditor, Chief Engineer, General Freight and Passenger Agent and Superintendent.

Concord & Montreal.—T. A. MacKinnon has been appointed General Manager.

Connecticut River.—The following directors were elected at the annual meeting this week: N. A. Leonard, F. H. Harris, James A. Rumrill, of Springfield, Mass.; O. S. Edwards, Charles S. Sargent, of Brookline; A. B. Harris, of Boston; Frederick Billings, of Woodstock, Vt.; William Whiting, of Holyoke; E. F. Lane, of Keene, N. H.

Dexter & Newport.—The stockholders at a meeting Sept. 10 elected the following officers: President, Charles Shaw; Treasurer, A. F. Bradbury; Clerk, Josiah Crosby. Directors, Charles Shaw, James W. Bradbury, Albert F. Bradbury, George Fisher, Oscar Holway, Wm. D. Sewall, Francis W. Hill.

Louisville, New Orleans & Texas.—J. G. Ansley, formerly Roadmaster of the Mobile & Montgomery Division of the Louisville & Nashville, has been appointed Roadmaster of this road.

Louisville Southern.—James J. Farnsworth has been appointed Division Passenger Agent of this road, with headquarters at Louisville, Ky.

New Brunswick.—C. E. McPherson has been appointed District Passenger Agent of the New Brunswick division of the Canadian Pacific, vice A. J. Heath, General Passenger and Ticket Agent, who has resigned.

New York Central & Hudson River.—The Mohawk and Hudson Division is hereafter to be operated in two divisions, the first extending from New York to and including East Albany, and known as the Hudson Division; the second extending from East Albany to Dewitt, including Troy, and known as the Mohawk Division. E. G. Allen is appointed Superintendent of the Hudson Division, with office at Grand Central Station, New York, and James H. Phyfe, Assistant Superintendent, with office at Sixty-fifth street and Eleventh avenue, New York. Charles M. Bissell will continue as Superintendent of the Mohawk Division, and Mr. F. A. Harrington as Assistant Superintendent, office at Albany, N. Y.

New York & Greenwood Lake.—W. C. Rinearson has been appointed General Passenger Agent of this company.

New York, Lake Erie & Western.—D. I. Roberts has been appointed Assistant General Passenger Agent in charge of business west of Buffalo and Salamanca, with headquarters at Chicago.

New York, New Haven & Hartford.—Albert S. Ostrander has been appointed Superintendent of the Shore Line Division with office at New Haven, Conn., in the place of E. G. Allen, resigned. Mr. Ostrander has been on the road since 1869, in various positions, and has been a passenger conductor on the New York Division for several years.

Pennsylvania Lines West of Pittsburgh.—D. I. Roberts, Assistant General Passenger Agent at Cincinnati, having resigned to accept service elsewhere, the duties of that agency will be conducted by F. W. Buskirk, City Passenger Agent, until further notice.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The first meeting of the stockholders of the new consolidated company was held in Pittsburgh, Sept. 16. The election of a board of directors resulted as follows: G. B. Roberts, J. N. DuBarry and John P. Green, Philadelphia; Thomas D. Messler, Pittsburgh; William L. Scott, Erie, Pa.; A. L. Dennis, Newark, N. J.; Samuel O. Pickens, Indianapolis; Frank Thomson, Philadelphia; J. N. McCullough and James McCrea, Pittsburgh; Robert Sherrard, Jr., Steubenville; George Willard, Chicago; Briggs S. Cunningham, Cincinnati.

St. Johnsbury & Lake Champlain.—The annual meeting was held at St. Johnsbury, Vt., Sept. 11, and the old board of directors elected.

San Antonio & Aransas Pass.—R. W. Andrews has been appointed General Passenger Agent. This is a new office.

Seattle, Lake Shore & Eastern.—The title of F. W. Dunn, Acting Superintendent, has been changed to Superintendent of the Western Division.

RAILROAD CONSTRUCTION.

Incorporations, Surveys, Etc.

Altoona & Wopsononock.—Work on this company's road is being pushed by Superintendent G. A. Patton. Over four miles has been graded, and most of this distance is ready for the rolling stock. Car shops and an engine house are now being built, and it will only be a short time before the trains will run through to Wopsononock.

Bellaire, Zanesville & Cincinnati.—This company has under consideration plans for changing its road to standard gauge, between Bellaire and Zanesville, O., 112 miles. Surveys have been made for the work, and many changes will be made in the alignment of the road. A large part of the line may be relocated. Plans have not yet been definitely decided, nor have the arrangements for securing funds to complete the work been made.

Brantford, Waterloo & Lake Erie.—The directors have, it is understood, abandoned the negotiations with J. N. Young & Co. for the transfer of the railroad and its property to that firm, the projectors of the Toronto, Hamilton & Buffalo, with which it was to be consolidated. The little work that has been in progress recently at a few points on the latter road has been entirely suspended.

Calgary & Edmonton.—Tracklaying is to begin this week on this road at Calgary, Alberta, and it is expected to lay 100 miles of track before the end of the present year. The grading has already been finished for a distance of 60 miles from Calgary, northerly.

Cape Fear & Yadkin Valley.—The extension south of Mt. Airy, N. C., to the Virginia state line will soon be ready for operation. The grading has reached the point where connection is to be made with the branch of the Norfolk & Western, which is being built north to meet it.

Columbia Central.—The bill before Congress for the incorporation of the above-mentioned company, which was mentioned in our last issue, provides for a railroad entering the District of Columbia at the southeast corner and running thence along the Anacostia River to Benning's Bridge, thence north of the Deaf and Dumb Institution to Eckington, near New York and Florida avenues. Among the incorporators are M. C. Mengis, Frank Brown and A. E. Booth.

Columbia, Newberry & Laurens.—About 10 miles of grading has been finished on the extension from Newberry northwest to Clinton, S. C. The tracklaying will be commenced on Oct. 1, and the entire 22 miles will probably be ready for operation this year. There are no iron bridges and but few trestles. Rice & Coleman, of Jalapa, S. C., have the contract for the grading.

Columbus, Lima & Milwaukee.—Work is being pushed again on this road, and it is intended to build as rapidly as possible to Saugatuck, Mich. The road is now graded for a distance of 100 miles, and it is expected to have 80 miles of track laid and ready for business before winter.

Cornwallis Valley.—The grading and tracklaying on this road have been about completed and it is expected to open it for traffic very soon. It extends from Kentville, Nova Scotia, on the Windsor & Annapolis road down the Cornwallis Valley for a distance of about 14 miles.

Denver & Rio Grande.—The survey for a ten mile extension of the Crested Butte branch has been completed. The contracts will probably be soon let, when grading will begin.

Duluth & Northern.—A certificate of the amendment of the articles of incorporation of the Duluth, North western & Winnipeg was filed recently and the name of that road was changed to the above. The road is located from Duluth, Minn., via Leach Lake and Red Falls to a point on the Canadian boundary in Kittson County, Minn.

Eastern Oregon.—This company has been incorporated in Oregon to build a road from Heppner, Or., to the coal mines at the head of Butte Creek, a distance of 26 miles, and thence to Sumpter, Or. Among the incorporators are: W. D. Fletcher, J. H. Roley, T. Rourke and J. R. Dickson.

East Tennessee, Virginia & Georgia.—It is again reported that surveyors have begun the survey for the extension of the Rome & Decatur division from Attalla to Decatur, Ala., to which the road was originally projected.

French Broad Valley.—The contractors have a large force of men working on this road near Asheville, N. C., and they have completed the grading for a distance of seven miles from that point.

Green Bay, Winona & St. Paul.—The branch of this road from Marshland to Eastmoor, Wis., three miles, is being rebuilt and is to be put in regular operation. The branch was built several years ago and the track was laid largely on trestle work. A good deal of this trestling is now being filled in. The work is being done by the company.

Harmon, Parsons & Rowelsburg.—The company was chartered by the Secretary of State of West Virginia last week. It proposes to build a road from Harmon, Randolph County, to Rowelsburg, Preston County. The principal office will be at Parsons. The capital stock, which is held in Philadelphia, Pa., is $1,000,000.

Intercolonial.—Work on the branch from Mulgrave to Terminal City, N. S., was begun last week. Large grain elevators are to be built at Terminal City as soon as the material which was ordered some time ago is received, which will probably be in a few days.

Little Wabash.—A good part of the right of way for this road in White County, Ill., has been secured and the company is securing the balance. A survey will be commenced in a few days. The road is to extend from Effingham to Carmi, Ill.

Louisville & Nashville.—Holmes & Davis, of Louisville, Ky., have been awarded the contract for $50,000 for grading and masonry work on the double tracking of the road from Shepardsville to Lebanon Junction, Tenn., a distance of 12 miles.

Lower Laurentian.—The rails for the section now being built have arrived, and the contractor will soon commence the tracklaying. About 500 men are employed between Rivierre a Pierre and St. Tite, Que., on the Canadian Pacific. The distance between these points is 40 miles, but 20 miles only is new work, the balance having been built over a year ago. There are two bridges on the section, one 500 ft. long and the second 300 ft. long. The bridge over the River Propre has been finished, and that over the Batiscan River is well advanced.

Lynchburg & Durham.—This road has been put in operation from Roxboro, its former southern terminus, to Durham, N. C., a distance of 32 miles. Trains are now running from Lynchburgh, Va., to Durham, N. C., a total distance of 114 miles.

Merchants' Bridge & Terminal Co.—The elevated structure of this company on the St. Louis side of the Mississippi River is now being rapidly erected. Considerable delay has been caused by the material not arriving promptly, but it is now expected that the structure will be completed by Nov. 15. Six of the eight locomotives ordered by the company have already arrived. The Union Depot Co. still objects to the plans by which the new company proposes to reach the union station, and may interpose further legal obstacles. The Merchants' Company will soon let contracts for the erection of an engine house and machine shop.

Middle Georgia & Atlantic.—R. T. Martin & Co., of Eatonton, Ga., who have the contract for the branch from the main line near Newborn north to Social Circle, have a large force of men and about 100 teams engaged in the work. There are few cuts and little other heavy work. The tracklaying will begin in about two months, when all the grading is finished.

New Roads.—A railroad is proposed from Pendleton, Or., 35 miles to coal mines recently opened.

Norfolk & Western.—J. R. Serpell, of 2,326 West Jefferson street, Louisville, Ky., has taken a large contract on the extension of this road through West Virginia to the Ohio River, and will sublet most of the work immediately. His headquarters will be at Mouth of Pigeon, Logan County, Ky.

A despatch from Knoxville states that engineers of this company have surveyed a line for a Knoxville extension from Bristol, Tenn., west to Bean's station, 40 miles from Knoxville. The engineers will commence this week locating the road from Bristol. The surveyors have been in the field six weeks and have run a line down the Holston Valley via Kingsport and Rogersville. It may be the intention to build to a connection near Morristown with the Knoxville, Cumberland Gap & Louisville, which will soon be running trains to Knoxville from that point.

Paducah, Tennessee & Alabama.—The road was completed from Paducah, Ky., to the Tennessee state line, a distance of 73 miles, on Sept. 10.

Pennsylvania.—O. F. Keenan, of Freeport, Pa., who had the contract for grading the uncompleted portion of the Turtle Creek Valley road to the connection with the Pennsylvania tracks at Stewart, Pa., has about completed the contract. There was about 1¼ miles of graduation uncompleted between Murraysville and Stewart, a distance of 6¼ miles.

Peru & Detroit.—All the grading between Peru and Chili, Ind., has been completed, and the rails have also been laid between the two points. The line will be ready for operation as soon as the ballasting and surfacing, which is now in progress, have been finished. The road will then be operated by the Wabash. It connects with the Detroit division of that road at Chili and with the main line at Peru.

Petersburg, Hirefield & Bayard.—The engineers have commenced the preliminary survey of the road northeasterly through Grant, Hardy and Hampshire counties in West Virginia. The road will probably connect with the West Virginia Central & Pittsburgh road at some point in Grant County.

Pittsburgh, Cincinnati & St. Louis.—A force of engineers is making surveys for an extension from New Cumberland, W. Va., across Hancock County, in the neck of West Virginia, and easterly into Pennsylvania. Some right of way for the extension has been purchased.

Providence, Ponagansett & Springfield.—A dispatch from Danielsonville, Conn., states that Coleman & Co., of Chicago, have been awarded the contract for building this road, which is proposed to extend from Hope, R. I., on the New York, Providence & Boston, to Danielsonville, on the Norwich & Worcester, and that work will be commenced by Nov. 1. Engineers are now surveying the route.

Providence & Springfield.—The company has filed with the Supreme Court of Rhode Island the location for a branch from Primrose station to Woonsocket, in that state. The stock of the road recently passed into the hands of the New York & New England, and with this connecting branch the New York & New England will have a second line between Boston and Providence.

Ravenswood, Spencer & Glenville.—The construction of this road from Ravenswood, Jackson County, W. Va., to Glenville, Gilmer County, 30 miles, is proceeding rapidly; nearly all the grading has been completed. It is hoped to have the road in operation by Feb. 1 next. It is being built by the Ohio River Road, and will be a feeder for that line.

Richmond & Danville.— A survey is being made by M. O. Hankins for a proposed extension from some point near Wilkesborough, N. C., northwest for a distance of over 60 miles to Bristol, Tenn.

St. Louis, Alton & Terre Haute.—Edward Litchfield, of Brooklyn, N. Y., has filed in the United States Court in Springfield, Ill., a bill for an order of injunction against the Executive Board of the road to restrain a transfer of the line by lease to the Cairo, Vincennes & Chicago. It is claimed that the alleged transfer as proposed is a mere shift to defraud the stockholders. He also charges that the net earnings have been applied to individual use instead of the payment of dividends.

St. Louis, Iron Mountain & Southern.—It is stated that an extension of the Batesville branch is being surveyed from Cushman to the mining district of Marion County and the cedar forests of Upper White River. A line was surveyed last year from Bald Knob, on the main line, and it will probably be soon decided from which point the extension will be made.

Toledo, Columbus & Cincinnati.—The contract has been let for constructing the extension from Kenton, the present southern terminus, to Ridgeway, O., 10 miles, where connection can be made with the Cleveland, Cincinnati, Chicago & St. Louis, and work has already begun.

Toledo, St. Louis & Kansas City.—The work of ballasting the western division of the road is being pushed, and it will be completed before winter sets in. The force at work has been augmented by additional gravel trains.

Toronto Belt Line.—The contractors on this road have suspended their work and discharged their employés. The President of the road, J. D. Edgar, states that the line will be completed and transferred to the Grand Trunk for operation by July 1, 1891.

Utah Central.—President John W. Young is reported as saying that the work of extending the company's lines will be actively carried on this fall. The company's proposed lines are from Salt Lake City, Utah, to Monehansett and Saltair beaches, and the extension of the Park City line 25 miles to Moon's sawmill in the heavy timber country. The company will also have a bathing resort at Monehansett. New bonds have been issued which will take up the outstanding bonds of the old railroad corporations now merged into the Utah Central, and will furnish the money necessary to make these improvements.

West Virginia Central.—This company's engineers are still engaged in the surveys for the extension from Davis. One party is now running a line down the valley of Laurel Creek toward Webster County, W. Va. Stakes are set as far as Cherry River.

White River.—This company, recently incorporated in the state of Washington, proposes to build from Buckley, Wash., in a southeasterly direction up the White River, a distance of 10 miles, this fall, and next season to some point on Puget Sound. The surveyors are in the field and construction will commence within a month. The object of the line is to open up a heavy timber district and to develop coal mines owned by Buckley parties. The roadbed and bridges will be prepared for standard gauge track, but the rails will be laid narrow gauge for temporary use. It is expected to use second-hand narrow gauge equipment for the first two or three years.

Woodstock.—The Woodstock Railroad, extending from Woodstock, Vt., to White River Junction, is evidently to be reorganized, as a new company called the Woodstock Railway, has recently been incorporated in Vermont, indicating a change of name.

GENERAL RAILROAD NEWS.

Baltimore & Ohio.—The earnings and expenses for August, 1890, compared with August, 1889 (August, 1890, approximated), were as follows: Earnings 1889, $2,133,784; 1890, $2,204,428; increase, 70,644; expenses, 1889, $1,219,302; 1890, $1,424,937; increase, $205,545; net 1889, $914,392; 1890, $779,491; decrease, $134,901. Earnimgs and expenses for the 11 months of the fiscal year 1889-90 compared with the same months of the fiscal year 1888-89 (August, 1890, approximated): Earnings, 1889, $19,223,765; 1890, $22,021,080; increase, $2,797,315; expenses, 1889, $13,555,474; 1890, $15,457,328; increase, $1,901,854; net 1889, $5,668,291; 1890, $6,563,752; increase, $895,461.

Atchison, Topeka & Santa Fe.—The gross earnings, operating expenses (exclusive of taxes and rentals), and the net earnings of the company and auxiliary lines for the month of July were as fallows:

	Gross Earn.	Oper. Expen.	Net Earn.	Oper. Mile.
Roads owned and controlled	$2,417,786	$1,842,232	$575,554	6,528
Roads jointly owned with other companies; Atchson's one-half	131,669	118,463	13,206	582
Total	$2,549,455	$1,960,695	$588,760	7,110
St. Louis & San Francisco:				
Roads owned and controlled	$555,473	$301,443	$254,031	1,329
Roads jointly owned with Atchison; 'Frisco company's one-half	129,260	123,845	15,416	526
Total	$684,733	$415,288	$269,446	1,855
Aggregate.—Both systems	$3,234,188	$2,375,983	$858,206	8,965

The comparative statement for all lines is:

Atchison System.	Gross Earnings.	Net Earnings.	—Per mile.— Gross Earn.	Net Earn.	Oper. Mil.
July, 1890	$2,549,455	$588,760	$358.57	$82.82	7,110
July, 1889	2,052,138	448,698	288.56	63.09	7,112
Inc. July, 1890	$497,317 (24%)	$140,062 (31%)	$70.01	$19 73	
'Frisco system.					
July, 1890	$684,733	$269,446	$369.05	$145.18	1,855
July, 1889	614,482	244,855	331.19	131.97	1,855
Inc. July, 1890	$70,251 (11%)	$24,591 (10%)	$37.86	$13.21	
Aggregated system.					
July, 1890	$3,234,188	$858,206	$360.74	$95.73	8,965
July, 1889	2,666,619	693,554	297.38	77.34	8,967
Inc. July, 1890	$567,469 (21%)	$164,652 (24%)	$66.36	$18.39	

Chicago, Milwaukee & St. Paul.—The annual report of the road for the year ending June 30, 1890, shows gross earnings of $26,405,703, an increase of $933,149 over the previous year; operating expenses, $17,173,097, an increase of $924,712; net earnings, $9,232,610, an increase of $358,435. President Roswell Miller says: "During the year traffic conditions have been unfavorable. The withdrawal of some of the most important lines from the Interstate Commerce Association deprived the railroads of an influence which, although it could not prevent reductions of rates, yet exerted a most wholesome restraint and saved much revenue. It is not apparent how a more effective agreement can be devised. The conditions which have led to low rates on competitive traffic have also reduced rates on local traffic through the operation of the long and short haul clause of the Interstate law. It is easy to say that these results can be avoided by simply obeying the law and maintaining rates. Obedience to the law will cure some of the evils that have prevailed, but will not enable inferior lines to compete with superior lines on even terms and secure a sufficient share of the traffic to support them. The only result possible under the law, as it now stands, is the absorption of the weaker by the stronger, and that is a painful process which can stop only when there is but one corporation, and competition is absolutely destroyed. Unrestrained competition will in the end destroy all competition. The efforts of legislatures and railroad commissions have also contributed not a little toward reduction of rates. An improvement in public sentiment had been hoped for, but is not yet apparent. It can hardly be expected until hostility to railroads ceases to be a short route to political preferment. In some of the States recent legislation is practical confiscation under the form of law, by the reduction of revenues and the increase of burdens."

Chicago Railway Transfer Association.—The general managers and general superintendents of all the Chicago lines, on Sept. 12, reorganized the Stock Yards Switching Association under the name of the Chicago Railway Transfer Association. The old executive board was re-elected, and Robert Law was appointed superintendent. The executive committee consists of H. F. Royce, Chairman; C. D. Law, J. D. Besler, P. P. Wright and H. L. Magee.

Chicago & St. Louis.—This road which extends from Springfield to Mt. Olive, Ill., has been leased to the Jacksonville South Eastern and will be operated as part of the Jacksonville South Eastern Line.

Covington & Macon.—Upon the application of the Mercantile Trust Co., of New York, the court at Macon, Ga., recently appointed John C. Key, Vice-President of the company, Receiver of this road, which extends from Macon to Athens, Ga., a distance of 107 miles. The company defaulted the semi-annual interest amounting to $35,000, due Sept. 1.

Delaware & Hudson Canal Co.—This company has issued a circular announcing the issue of 55,000 shares of new stock at $75 per share to stockholders of record on Oct. 15. Each holder will be entitled to subscribe for one new share for each four shares and a half which he holds. The market price of the stock is a little more than $156 per share, so that the privilege of subscription is equivalent to cash dividend of about $18 a share. The difference between the price of the stock and its par value—that is to say, $25 per share—is to be made up out of the surplus held in the treasury of the company. The proceeds of the sale of stock, together with this $25 per share, are to be devoted to retiring an issue of $5,500,000 of bonds due on Jan. 1, 1891.

Knox & Lincoln.—A decision was rendered this week by Judge Haskell in the case of the town of Waldoboro's application for an injunction against the sale of the road to the Penobscot Shore Line Company. The injunction was refused, but an indemnifying bond of $20,000 was required of the purchasing parties. The new company will probably take possession without further delay.

New York Central & Hudson River.—The statement of the gross earnings for August, issued this week, gives the earnings for 1890 as $2,843,522, against $3,400,985 for the corresponding period in 1889. The decrease is $557,463, about 15 per cent.

Savannah, Griffin & North Alabama.—This road, which is controlled by the Central of Georgia, is to be sold by the receiver at auction at Griffin, Ga., Nov. 4, under the order of the Superior Court of Spaulding County. The road extends from Griffin westward to Carrollton, 60 miles, and is operated as a part of the Central. No bid of less than $500,000 will be received.

Seattle, Lake Shore & Eastern.—The trustees have authorized A. S. Dunham, President of the road, to transfer the Spokane division to the Northern Pacific.

Wisconsin Central.—A despatch from Madison, Wis. says that the suit brought by the company to oust E. A. Beilkan, J. L. J. Lentz and A. O. Forsythe from certain lands in Ashland County, which they had preempted, has been decided against it. The company claimed that the lands belonged to it as part of its land grant, but the federal government had previously ruled that though they were within the territorial limits of road's grants they had been excepted from it for various reasons. The land involved in the litigation is only a small portion of a tract of 100,000 acres, valued at $2,000,000, the title to which depends on the decision in this suit. Last June the case was argued before Justices Harlan and Vann, of the United States Court. These are test cases. The railroad company will carry them to the Supreme Court.

TRAFFIC.

Chicago Traffic Matters.

CHICAGO, Sept. 17, 1890.

The following bodies have agreed to join the proposed National Association of Shippers: Toledo Produce Exchange, Indianapolis Board of Trade, Cincinnati Chamber of Commerce, Kansas City Transportation Bureau, Dubuque Board of Trade, Detroit Board of Trade, Merchants' Exchange of St. Louis, Milwaukee Chamber of Commerce, Chicago Board of Trade, Peoria Board of Trade, Salt Lake City Chamber of Commerce and Louisville Board of Trade. In addition twenty others, such as the Boston Chamber of Commerce and the Philadelphia Board of Trade, have announced unofficially that their governing bodies would vote to join at their next meetings.

Chairman Midgley reports for the first ten days of this month the following distribution of freight from Southwestern Missouri River points: Atchison took 1,238 cars, Burlington 312, Rock Island 392, St. Paul 390, Missouri Pacific 308, Alton 355, Kansas City, Fort Scott & Memphis 238, Chicago, St. Paul & Kansas City 204, Wabash 199. Total 3,996 cars. Since the last report the Atchison has turned over considerable freight to the other roads, in accordance with the decision of the Board of Chairmen, but it still continues to get a large percentage. The other roads are getting restless and the Board of Chairmen, Messrs. Walker, Goddard, Faithorn, Midgley and Finley, have issued a notice appointing Oct. 1 for a further discussion of the question of division of traffic. The Atchison, of course, bills through over its own line from all points on its large mileage in Kansas and will strenuously resist any demand to divide this freight more liberally with its competitors east of the Missouri.

A committee of the Western Passenger Association has under consideration a proposal of the Rock Island to reduce the number of passenger trains, provided competing lines would take similar action, and to reduce the speed of stock trains.

The managers of the Western roads were advised yesterday by the Interstate Commerce Commission that the order reducing grain rates from the Missouri River and points beyond was further suspended until Oct. 1. The Commission also gave the roads permission to correct the error in its original adjustment of the rates in order to preserve the old basis of differentials on Mississippi River business. Accordingly the rate on wheat to St. Louis will be 15 cents instead of 14. The wheat rate to Chicago is unchanged from the original figure, 20 cents. Rates on corn will remain 12 cents to St. Louis and 17 to Chicago. The Rock Island and the Alton will now wait until Oct. 1 before putting the new reduced rates into effect, in order that the new tariffs may be simultaneously adopted by all the interested lines.

Traffic Notes

The annual report of the Wabash states that the Traffic Association expenses of that road for the last fiscal year were $42,318.

The St. Joseph & Grand Island is to erect a grain elevator in Elwood, Kan., opposite St. Joseph, with a capacity of one million bushels.

The Cleveland Car Service Association handled 32,413 cars in August. Of these 76 per cent. were released in 48 hours or less. The average detention of the remainder was 1.15 days.

The collections for demurrage doubled at Buffalo when the Association abandoned mere persuasive methods and issued strict orders to hold cars, which had earned car service, in all cases where consignees refused to pay.

Commissioners Morrison and Veazey were at St. Louis last week hearing a complaint of East St. Louis millers against the St. Louis, Alton & Terre Haute alleging discriminations in rates on flour to Southern points.

The Ohio & Mississippi has reduced the passenger rate from Cincinnati to St. Louis to $6, and has been followed by the two competing lines. The first reduction is said to have been forced by the fact that scalpers had blocks of competitors' tickets which they were selling at $7.

East-bound Shipments.

The shipments of east-bound freight from Chicago by all the lines for the week ending Saturday, Sept. 13, amounted to 72,520 tons, against 71,503 tons during the preceding week, an increase of 1,017 tons, and against 50,539 tons during the corresponding week of 1889, an increase of 21,981 tons. The proportions carried by each road were:

	W'k to Sept. 13		W'k to Sept. 6	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	8,857	12.2	8,662	12.1
Wabash	4,007	5.5	4,107	5.7
Lake Shore & Michigan South.	12,033	16.6	11,313	16.1
Pitts., Ft. Wayne & Chicago	8,892	12.3	7,667	10.7
Chicago, St. Louis & Pitts.	8.651	11.9	8,993	12.5
Baltimore & Ohio	4 844	6.7	4,270	5.9
Chicago & Grand Trunk	10,642	14.7	11,294	15.8
New York, Chic. & St. Louis	6,695	9.2	5,627	7.8
Chicago & Atlantic	7,879	10.9	9,570	13.4
Total	72,520	100.0	71,503	100.0

Of the above shipments 1,910 tons were flour, 28,507 tons grain, 2,454 tons millstuffs, 7,278 tons cured meats, 1,630 tons lard, 8,968 tons dressed beef, 165 tons butter, 1,308 tons hides, 390 tons wool, and 7,370 tons lumber. The three Vanderbilt lines together carried 38.0 per cent., while the two Pennsylvania lines carried 24.2 per cent. The lake lines carried 67,319 tons of freight, of which 3,561 tons were flour, and 54,294 tons, grain.